

The neotropical mantids (*Insecta: Dictyoptera: Mantodea*) (Ehrmann – 30. v. 2009)

by

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Abstract: The neotropical mantids (*Insecta: Dictyoptera: Mantodea*) (Ehrmann – 30.v.2009). *Cesa News* 49: 1- 18, 4 figs.

In the order of Mantodea totally 15 families, 51 subfamilies, 18 tribes, 448 genera and 2420 species are known in the World. The present article deals with the revised list of the 94 genera and 496 species, known in the Neotropical Region (Central- and South America), belong to 8 families, 19 subfamilies, and 5 tribes.

Key words: Mantodea, Dictyoptera, Neotropical Region, checklist.

Co-authorship of this article became possible after Reinhard Ehrmann's kind invitation to me. So far as I know, Reinhard Ehrmann, devoted his life to the studies on the World *Mantodea* and as a result of this contributed greatly to this branch of science with his valuable publications and a world famous book entitled "*Mantodea Gottesanbeterinnen der Welt*". Besides, Reinhard Ehrmann established the largest European Mantodea Collection at Staatliches Museum für Naturkunde Karlsruhe (SMNK) in 30 years, which consists of 11904 specimens, including many types. On the other hand, I personally feel myself close to him, as he worked in SMNK for many years. In the first part of my academic life, nearly 20 years, I also studied discontinuously at SMNK, in the Lepidoptera Department. Unfortunately, I could not find an opportunity in recognizing Reinhard Ehrmann during my staying there. Today, I am aware of this neglection could not be apologized. I sincerely express here that becoming a co-author of Ehrmann's publication is an honour for me and a great chance in order to compensate for the previous lost years.



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Figures 1-4. The authors. **1-3:** Reinhard Hermann at his office at SMNK, **4:** Ahmet Ömer Koçak on the right in a remembering photo in front of the SMNK in 1978, together with his dear friends Günter Ebert and Bernd Traub.

List of the Mantodea

In the following list, all the genera and the species are arranged in the alphabetical order under the related families, subfamilies and tribes.

Acanthopidae BURMEISTER, 1838

Acanthopinae BURMEISTER, 1838

Acanthops AUDINET-SERVILLE, 1831

- Acanthops bidens HEBARD, 1922
- Acanthops centralis LOMBARDO & IPPOLITO, 2004
- Acanthops chocoensis SALAZAR, 2005
- Acanthops contorta GERSTAECKER, 1889
- Acanthops elegans LOMBARDO & IPPOLITO, 2004
- Acanthops erosa AUDINET-SERVILLE, 1839
- Acanthops erosula STÅL, 1877
- Acanthops falcata STÅL, 1877
- Acanthops falcataria (GOEZE, 1778)
- Acanthops fuscifolia (OLIVIER, 1792)
- Acanthops godmani SAUSSURE & ZEHNTNER, 1894
- Acanthops onorei LOMBARDO & IPPOLITO, 2004
- Acanthops parafalcata LOMBARDO & IPPOLITO, 2004
- Acanthops parva BEIER, 1942
- Acanthops royi LOMBARDO & IPPOLITO, 2004
- Acanthops septemspinosa IPPOLITO, 2007
- Acanthops soukana ROY, 2002
- Acanthops tuberculata SAUSSURE, 1870

Decimiana UVAROV, 1940

- Decimiana bolivari (CHOPARD, 1916)
- Decimiana clavata IPPOLITO & LOMBARDO, 2004
- Decimiana hebardi LOMBARDO, 2000
- Decimiana rehni (CHOPARD, 1913)
- Decimiana tessellata (CHARPENTIER, 1841)

Lagrecacanthops ROY, 2004

- Lagrecacanthops brasiliensis ROY, 2004
- Lagrecacanthops guyanensis ROY, 2004

Metilia STÅL, 1877

- Metilia amazonica (BEIER, 1930)
- Metilia boliviensis (WERNER, 1927)
- Metilia brunnerii (SAUSSURE, 1871)

Miracanthops ROY, 2004

- Miracanthops eseejja RIVERA, 2005
- Miracanthops lombardoi ROY, 2004

Miracanthops occidentalis (LOMBARDO & IPPOLITO, 2004)
 Miracanthops poulaini ROY, 2004

Pseudacanthops SAUSSURE, 1870

Pseudacanthops angulata (LICHENSTEIN, 1802)
 Pseudacanthops caelebs (SAUSSURE, 1869)
 Pseudacanthops lobipes LA GRECA & LOMBARDI, 1997
 Pseudacanthops spinulosa (SAUSSURE, 1870)

Acontistinae GIGLIO-TOS, 1919

Acontista SAUSSURE & ZEHNTNER, 1894

Acontista amazonica (BEIER, 1929)
 Acontista amoenula GERSTAECKER, 1889
 Acontista aurantiaca (BURMEISTER, 1838)
 Acontista bimaculata SAUSSURE, 1870
 Acontista bolivarii GIGLIO-TOS, 1915
 Acontista brevipennis SAUSSURE, 1872
 Acontista cayennensis SAUSSURE & ZEHNTNER, 1894
 Acontista championi KIRBY, 1904
 Acontista chopardi GIGLIO-TOS, 1927
 Acontista concinna (PERTH, 1832)
 Acontista cordillerae SAUSSURE, 1869
 Acontista cubana ZAYAS, 1974
 Acontista ecuadorica (HEBARD, 1924)
 Acontista eximia (PASCOE, 1882)
 Acontista festae GIGLIO-TOS, 1915
 Acontista fraterna SAUSSURE & ZEHNTNER, 1894
 Acontista gracilis CHOPARD, 1911
 Acontista inquinata SAUSSURE & ZEHNTNER, 1894
 Acontista iriodes (HEBARD, 1919)
 Acontista maroniensis CHOPARD, 1912
 Acontista mexicana SAUSSURE & ZEHNTNER, 1894
 Acontista minima GIGLIO-TOS, 1915
 Acontista multicolor SAUSSURE, 1870
 Acontista paraensis SAUSSURE & ZEHNTNER, 1894
 Acontista piracicabensis (PIZA, 1964)
 Acontista quadrimaculata (AUDINET-SERVILLE, 1839)
 Acontista rehni GIGLIO-TOS, 1927
 Acontista semirufa (WESTWOOD, 1889)
 Acontista travassosi (JANTSCH, 1986)
 Acontista tricolor (BURMEISTER, 1838)
 Acontista violacea (BEIER, 1931)
 Acontista vitrea SAUSSURE & ZEHNTNER, 1894

Astollia KIRBY, 1904

Astollia chloris (OLIVIER, 1792)

Callibia STÅL, 1877

Callibia diana (STOLL, 1813)

Paratithrone LOMBARDO, 1996

Paratithrone royi LOMBARDO, 1996

Raptrix TERRA, 1995

Raptrix intermedia LOMBARDO & MARLETTA, 2004

Raptrix occidentalis LOMBARDO & MARLETTA, 2004

Raptrix perspicua (FABRICIUS, 1787)

Raptrix westwoodi (SAUSSURE & ZEHNTNER, 1894)

Tithrone STÅL, 1877

Tithrone catharinensis PIZA, 1961

Tithrone clauseni JANTSCH, 1995

Tithrone corseuili JANTSCH, 1986

Tithrone laeta LOMBARDO, 1996

Tithrone latipennis LOMBARDO, 1996

Tithrone major PIZA, 1962

Tithrone roseipennis (SAUSSURE, 1870)

Stenophyllinae BURMEISTER, 1838**Stenophylla WESTWOOD, 1843**

Stenophylla cornigera WESTWOOD, 1843

Stenophylla gallardi ROY, 2005

Stenophylla lobivertex LOMBARDO, 2000

Chaeteessidae HANDLIRSCH, 1925**Chaeteessa BURMEISTER, 1838**

Chaeteessa caudata SAUSSURE, 1871

Chaeteessa filata BURMEISTER, 1838

Chaeteessa nana JANTSCH, 1995

Chaeteessa nigromarginata SALAZAR, 2004

Chaeteessa valida (PERTY, 1833)

Hymenopodidae GIGLIO-TOS, 1919**Epaphroditinae GIGLIO-TOS, 1919****Epaphrodita AUDINET-SERVILLE, 1831**

Epaphrodita lobivertex LOMBARDO & PEREZ-GELABERT, 2004

Epaphrodita musarum (PALISOT DE BEAUVOIS, 1805)

Epaphrodita undulata (SAUSSURE, 1870)

Liturgusidae GIGLIO-TOS, 1919

Liturgusinae GIGLIO-TOS, 1919

Gonatista SAUSSURE, 1869

Gonatista grisea (FABRÍCIUS, 1793)
Gonatista jaiba LOMBARDO & PEREZ-GELABERT, 2004
Gonatista major CAUDELL, 1912
Gonatista phryganoides (AUDINET-SERVILLE, 1839)
Gonatista reticulata (THUNBERG, 1815)

Hagiomantis SAUSSURE & ZEHNTNER, 1894

Hagiomantis fluminensis PIZA, 1965
Hagiomantis ornata (STOLL, 1813)
Hagiomantis pallida BEIER, 1942
Hagiomantis parva PIZA, 1966
Hagiomantis superba (GERSTAECKER, 1889)
Hagiomantis surinamensis (SAUSSURE, 1872)

Liturgusa SAUSSURE, 1869

Liturgusa actuosa REHN, 1951
Liturgusa annulipes (AUDINET-SERVILLE, 1839)
Liturgusa atricoxata BEIER, 1931
Liturgusa cayennensis (SAUSSURE, 1869)
Liturgusa charpentieri GIGLIO-TOS, 1927
Liturgusa cursor REHN, 1951
Liturgusa lichenalis GERSTAECKER, 1889
Liturgusa maya (SAUSSURE & ZEHNTNER, 1894)
Liturgusa mesopoda (WESTWOOD, 1889)
Liturgusa nubeculosa GERSTAECKER, 1889
Liturgusa parva GIGLIO-TOS, 1915
Liturgusa sinvalnetoi PIZA, 1982

Mellierinae GIGLIO-TOS, 1919

Melliera SAUSSURE, 1892

Melliera brevipes (BEIER, 1931)
Melliera chorotega REHN, 1935
Melliera major (SAUSSURE, 1872)
Melliera mordax REHN, 1935

Xystropeltis REHN, 1935

Xystropeltis lankesteri REHN, 1935

Xystropeltis meridionalis LOMBARDO, 2000
 Xystropeltis quadrilobata TERRA, 1991

Mantidae BURMEISTER, 1838

Amelinae WESTWOOD, 1889

Litaneutria SAUSSURE, 1892

Litaneutria borealis (BRUNER, 1893)
 Litaneutria longipennis BEIER, 1929
 Litaneutria minor (SCUDDER, 1872)
 Litaneutria obscura SCUDDER, 1896
 Litaneutria ocularis SAUSSURE, 1892
 Litaneutria pacifica SCUDDER, 1896
 Litaneutria skinneri REHN, 1907

Yersinia SAUSSURE, 1869

Yersinia mexicana (SAUSSURE, 1859)

Yersiniops HEBARD, 1931

Yersiniops newboldi HEBARD, 1931
 Yersiniops solitaria (SCUDDER, 1896)
 Yersiniops sophronica (REHN & HEBARD, 1908)

Angelinae BEIER, 1935

Angela AUDINET-SERVILLE, 1839

Angela armata (DE HAAN, 1842)
 Angela championi SAUSSURE & ZEHNTNER, 1894
 Angela decolor (CHOPARD, 1914)
 Angela guianensis REHN, 1906
 Angela lemóulti (CHOPARD, 1910)
 Angela maxima (CHOPARD, 1910)
 Angela minor (GIGLIO-TOS, 1916)
 Angela miranda SAUSSURE, 1871
 Angela perpulchra WESTWOOD, 1889
 Angela peruviana (GIGLIO-TOS, 1916)
 Angela purpurascens (OLIVIER, 1792)
 Angela quinquemaculata (OLIVIER, 1792)
 Angela saussurii GIGLIO-TOS, 1927
 Angela subhyalina (CHOPARD, 1914)
 Angela trifasciata trifasciata STÅL, 1877
 Angela trifasciata chocoana SALAZAR, 2004
 Angela werner (CHOPARD, 1914)

Thespoides CHOPARD, 1916

Thespoides bolivari CHOPARD, 1916

Antemninae TERRA, 1995**Antemna STÅL, 1877**

Antemna rapax STÅL, 1877

Choeradodinae KIRBY, 1904**Choeradodini KIRBY, 1904****Choeradodis AUDINET-SERVILLE, 1831**

Choeradodis columbica BEIER, 1931

Choeradodis rhombicollis mph. rhombicollis (LATREILLE, 1833)

Choeradodis rhombicollis mph. brunneri WOOD-MASON, 1882

Choeradodis rhombicollis mph. servillei WOOD-MASON, 1880

Choeradodis rhomboidea (STOLL, 1813)

Choeradodis stalii WOOD-MASON, 1880

Choeradodis strumaria (LINNÉ, 1758)

Photininae GIGLIO-TOS, 1915**Coptopterygini BEIER, 1964****Brunneria SAUSSURE, 1869**

Brunneria borealis SCUDDER, 1896

Brunneria brasiliensis SAUSSURE, 1870

Brunneria gracilis GIGLIO-TOS, 1915

Brunneria longa GIGLIO-TOS, 1915

Brunneria orinocensis AGUDELO RONDON & CHICA ECHEVERRI, 2002

Brunneria subaptera SAUSSURE, 1869

Coptopteryx SAUSSURE, 1869

Coptopteryx argentina (BURMEISTER, 1864)

Coptopteryx bonariensis (PIZA, 1960)

Coptopteryx brevipennis BEIER, 1958

Coptopteryx claraziana SAUSSURE, 1869

Coptopteryx constricta REHN, 1913

Coptopteryx ermannoi JANTSCH & CORSEUIL, 1988

Coptopteryx fallax GIGLIO-TOS, 1917

Coptopteryx gayi (BLANCHARD, 1851)

Coptopteryx gigliotosi WERNER, 1925

Coptopteryx gracilis GIGLIO-TOS, 1915

Coptopteryx inermis WERNER, 1925

Coptopteryx magna GIGLIO-TOS, 1915

Coptopteryx parva GIGLIO-TOS, 1915

Coptopteryx platana GIGLIO-TOS, 1915

Coptopteryx precaria (PIZA, 1966)

Coptopteryx pusilla WERNER, 1925

Coptopteryx spinosa GIGLIO-TOS, 1915

Coptopteryx thoracica REHN, 1913
Coptopteryx thoracoides GIGLIO-TOS, 1915
Coptopteryx viridis ? GIGLIO-TOS, 1915

Photinaini GIGLIO-TOS, 1915

Cardioptera BURMEISTER, 1838

Cardioptera brachyptera BURMEISTER, 1838
Cardioptera minor REHN, 1916
Cardioptera nigridens WERNER, 1925
Cardioptera parva BEIER, 1942
Cardioptera squalodon WERNER, 1932
Cardioptera viridipennis BEIER, 1931

Colombiella KOÇAK & KEMAL, 2008

Colombiella planicephala (REHN, 1916)

Hicetia SAUSSURE & ZEHNTNER, 1894

Hicetia breviceps (STÅL, 1877)
Hicetia goeldiana SAUSSURE & ZEHNTNER, 1894

Macromantis SAUSSURE, 1871

Macromantis hyalina (DE GEER, 1773)
Macromantis nicaraguae SAUSSURE & ZEHNTNER, 1894
Macromantis ovalifolia (STOLL, 1813)
Macromantis saussurei ROY, 2002

Metriomantis SAUSSURE & ZEHNTNER, 1894

Metriomantis boliviana LOMBARDO, 1999
Metriomantis cupido (SAUSSURE, 1869)
Metriomantis occidentalis LOMBARDO, 1999
Metriomantis ovata ? SAUSSURE & ZEHNTNER, 1894
Metriomantis paraensis GIGLIO-TOS, 1915
Metriomantis pilosa (CHOPARD, 1912)
Metriomantis pilosella GIGLIO-TOS, 1915

Microphotina BEIER, 1935

Microphotina vitripennis (SAUSSURE, 1872)

Orthoderella GIGLIO-TOS, 1897

Orthoderella delucchii RIVERA, 2003
Orthoderella ornata GIGLIO-TOS, 1897

Paraphotina GIGLIO-TOS, 1915

Paraphotina insolita (REHN, 1941)
Paraphotina occidentalis LOMBARDO, 1998
Paraphotina reticulata (SAUSSURE, 1871)

Photina BURMEISTER, 1838

Photina amplipennis STÅL, 1877
Photina gracilis GIGLIO-TOS, 1915

Photina laevis GIGLIO-TOS, 1915
Photina reticulata (BURMEISTER, 1838)
Photina vitrea (BURMEISTER, 1838)

Photinella GIGLIO-TOS, 1915

Photinella biramosa (SAUSSURE & ZEHNTNER, 1894)
Photinella brevis (REHN, 1907)
Photinella magna GIGLIO-TOS, 1915
Photinella media GIGLIO-TOS, 1915
Photinella silvai (PIZA, 1968)

Stagmomantinae TERRA, 1995

Callimantis STÅL, 1877

Callimantis antillarum (SAUSSURE, 1859)

Phasmomantis SAUSSURE, 1869

Phasmomantis championi SAUSSURE & ZEHNTNER, 1894
Phasmomantis sumichrasti (SAUSSURE, 1861)

Stagmomantis SAUSSURE, 1869

Stagmomantis amazonica (JANTSCH, 1985)
Stagmomantis californica REHN & HEBARD, 1909
Stagmomantis carolina (JOHANSSON, 1763)
Stagmomantis centralis (GIGLIO-TOS, 1917)
Stagmomantis colorata HEBARD, 1922
Stagmomantis domingensis (PALISOT DE BEAUVOIS, 1805)
Stagmomantis floridensis DAVIS, 1919
Stagmomantis fraterna SAUSSURE & ZEHNTNER, 1894
Stagmomantis gracilipes REHN, 1907
Stagmomantis hebardi REHN, 1935
Stagmomantis heterogamia SAUSSURE & ZEHNTNER, 1894
Stagmomantis limbata (HAHN, 1835)
Stagmomantis montana montana SAUSSURE & ZEHNTNER, 1894
Stagmomantis montana sinaloae REHN, 1935
Stagmomantis nahua SAUSSURE, 1869
Stagmomantis pagana
Stagmomantis paraensis (JANTSCH, 1985)
Stagmomantis parvidentata parvidentata (BEIER, 1931)
Stagmomantis parvidentata colombiana ARIZA & SALAZAR, 2005
Stagmomantis theophila REHN, 1904
Stagmomantis tolteca
Stagmomantis venusta SAUSSURE & ZEHNTNER, 1894
Stagmomantis vicina SAUSSURE, 1870

Stagmatopterinae BEIER, 1964

Catoxyopsis GIGLIO-TOS, 1914

Catoxyopsis dubiosa (GIGLIO-TOS, 1898)

Chopardiella GIGLIO-TOS, 1914

Chopardiella latipennis (CHOPARD, 1911)
Chopardiella poulaini LOMBARDO & AGABITI, 2001

Lobocneme REHN, 1911

Lobocneme colombiae HEBARD, 1919
Lobocneme lobipes (REDTENBACHER, 1892)

Oxyopsis CAUDELL, 1904

Oxyopsis acutipennis (STÅL, 1877)
Oxyopsis festae GIGLIO-TOS, 1914
Oxyopsis gracilis GIGLIO-TOS, 1914
Oxyopsis lobeter REHN, 1907
Oxyopsis media (STÅL, 1877)
Oxyopsis obtusa (STÅL, 1877)
Oxyopsis oculea (REHN, 1920)
Oxyopsis peruviana CHOPARD, 1916
Oxyopsis rubicunda (STOLL, 1813)
Oxyopsis saussurei GIGLIO-TOS, 1914
Oxyopsis stali GIGLIO-TOS, 1914

Parastagmatoptera SAUSSURE, 1871

Parastagmatoptera abnormis BEIER, 1963
Parastagmatoptera amazonica WERNER, 1928
Parastagmatoptera concolor JANTSCH, 1984
Parastagmatoptera confusa GIGLIO-TOS, 1914
Parastagmatoptera flavoguttata (AUDINET-SERVILLE, 1839)
Parastagmatoptera glauca REHN, 1920
Parastagmatoptera hoorie (CAUDELL, 1910)
Parastagmatoptera pellucida GIGLIO-TOS, 1914
Parastagmatoptera serricornis KIRBY, 1904
Parastagmatoptera tessellata SAUSSURE & ZEHNTNER, 1894
Parastagmatoptera unipunctata (BURMEISTER, 1838)
Parastagmatoptera vitrepennis BRUNER, 1906
Parastagmatoptera zernyi BEIER, 1930

Paroxyopsis REHN, 1911

Paroxyopsis icterica (SAUSSURE & ZEHNTNER, 1894)

Pseudoxyops SAUSSURE & ZEHNTNER, 1894

Pseudoxyops boliviana GIGLIO-TOS, 1914
Pseudoxyops borellii (GIGLIO-TOS, 1897)
Pseudoxyops diluta (STOLL, 1813)
Pseudoxyops minuta GIGLIO-TOS, 1914
Pseudoxyops perpulchra (WESTWOOD, 1889)

Stagmatoptera BURMEISTER, 1838

Stagmatoptera abdominalis (OLIVIER, 1792)
Stagmatoptera binotata SCUDDER, 1869
Stagmatoptera biocellata SAUSSURE, 1869

Stagmatoptera femoralis SAUSSURE & ZEHNTNER, 1894
Stagmatoptera flavipennis (AUDINET-SERVILLE, 1839)
Stagmatoptera hyaloptera (PERTY, 1832)
Stagmatoptera ignota GIGLIO-TOS, 1914
Stagmatoptera indicator (OLIVIER, 1792)
Stagmatoptera nova BEIER, 1930
Stagmatoptera pia SAUSSURE & ZEHNTNER, 1894
Stagmatoptera precaria (LINNÉ, 1758)
Stagmatoptera reimoseri BEIER, 1929
Stagmatoptera septentrionalis SAUSSURE & ZEHNTNER, 1894
Stagmatoptera supplicaria (STOLL, 1813)

Vatinae STÅL, 1877

Callivates ROY, 2003
Callivates stephanei ROY, 2003

Hagiotata SAUSSURE & ZEHNTNER, 1894
Hagiotata hofmanni (SAUSSURE & ZEHNTNER, 1894)

Heterovates SAUSSURE, 1872
Heterovates pardalina SAUSSURE, 1872

Lobovates DEELEMANN-REINHOLD, 1957
Lobovates chopardi DEELEMANN-REINHOLD, 1957

Phyllovates KIRBY, 1904
Phyllovates brasiliensis PIZA, 1982
Phyllovates brevicollis OROFINO, IPPOLITO & LOMBARDO 2006
Phyllovates brevicornis (STÅL, 1877)
Phyllovates chlorophaea (BLANCHARD, 1836)
Phyllovates cingulata (DRURY, 1773)
Phyllovates cornuta (SAUSSURE & ZEHNTNER, 1894)
Phyllovates gracilicollis OROFINO, IPPOLITO & LOMBARDO 2006
Phyllovates iheringi (SAUSSURE & ZEHNTNER, 1894)
Phyllovates maya (SAUSSURE & ZEHNTNER, 1894)
Phyllovates minor (SAUSSURE, 1872)
Phyllovates parallela (DE HAAN, 1842)
Phyllovates parvula (WESTWOOD, 1889)
Phyllovates spinicollis (SAUSSURE & ZEHNTNER, 1894)
Phyllovates stolli (SAUSSURE & ZEHNTNER, 1894)
Phyllovates tripunctata (BURMEISTER, 1838)

Pseudovates SAUSSURE, 1869
Pseudovates arizonae HEBARD, 1935
Pseudovates bidens (FABRICIUS, 1775)
Pseudovates denticulata (SAUSSURE, 1870)
Pseudovates halostigma MELLO-LEITAO, 1937
Pseudovates longicollis STÅL, 1877
Pseudovates paraensis (SAUSSURE, 1871)
Pseudovates tolteca (SAUSSURE, 1859)

Pseudovates townsendi (REHN, 1901)

Vates BURMEISTER, 1838

- Vates amazonica (WESTWOOD, 1889)
- Vates biplagiata SJÖSTEDT, 1930
- Vates boliviana GIGLIO-TOS, 1914
- Vates festae GIGLIO-TOS, 1898
- Vates foliata (LICHENSTEIN, 1802)
- Vates lobata (FABRICIUS, 1798)
- Vates luxuriosa BEIER, 1958
- Vates multilobata (CHOPARD, 1910)
- Vates obscura PIZA, 1983
- Vates pectinata SAUSSURE, 1871
- Vates pectinicornis (STÅL, 1877)
- Vates peruviana REHN, 1911
- Vates serraticornis (STÅL, 1877)
- Vates weyrauchi BEIER, 1958

Zoolea AUDINET-SERVILLE, 1839

- Zoolea descampsi ROY, 2009
- Zoolea lobipes (OLIVIER, 1792)
- Zoolea major GIGLIO-TOS, 1914
- Zoolea minor GIGLIO-TOS, 1914
- Zoolea orba (BURMEISTER, 1838)

Mantoididae CHOPARD, 1949

Mantoida NEWMAN, 1838

- Mantoida argentinae LA GRECA & LOMBARDO, 1989
- Mantoida brunneriana (SAUSSURE, 1871)
- Mantoida burmeisteri (GIEBEL, 1862)
- Mantoida fulgidipennis WESTWOOD, 1889
- Mantoida luteola WESTWOOD, 1889
- Mantoida maya SAUSSURE & ZEHNTNER, 1894
- Mantoida nitida NEWMAN, 1838
- Mantoida ronderosi LA GRECA & LOMBARDO, 1989
- Mantoida schraderi REHN, 1951
- Mantoida tenuis (PERTY, 1833)

Tarachodidae HANDLIRSCH, 1930

Iridinae WESTWOOD, 1889

Iris SAUSSURE, 1869

- Iris strigosa (STOLL, 1813)

Thespidae SAUSSURE, 1869

Miopteryginae KIRBY, 1904

Calopteromantis TERRA, 1982

Calopteromantis hebardi TERRA, 1982

Calopteromantis marulandae SALAZAR, 2002

Calopteromantis otongica LOMBARDO & AYALA, 1998

Calopteromantis terrai JANTSCH, 1994

Chloromiopteryx GIGLIO-TOS, 1915

Chloromiopteryx thalassina (BURMEISTER, 1838)

Emboicy TERRA, 1982

Emboicy mirim TERRA, 1982

Miobantia GIGLIO-TOS, 1917

Miobantia aptera GIGLIO-TOS, 1917

Miobantia ciliata (STÅL, 1860)

Miobantia fuscata (GIGLIO-TOS, 1915)

Miobantia nebulosa (GIGLIO-TOS, 1915)

Miobantia phryganea (SAUSSURE, 1869)

Miobantia rustica (FABRICIUS, 1781)

Promiopteryx GIGLIO-TOS, 1915

Promiopteryx fallax GIGLIO-TOS, 1915

Promiopteryx granadensis (SAUSSURE, 1870)

Promiopteryx punctata GIGLIO-TOS, 1917

Promiopteryx simplex GIGLIO-TOS, 1915

Promiopteryx stigmatica (BURMEISTER, 1838)

Oligonicinae GIGLIO-TOS, 1919

Oligonicini GIGLIO-TOS, 1919

Bactromantis SCUDDER, 1896

Bactromantis mexicana (SAUSSURE & ZEHNTNER, 1894)

Bactromantis tolteca (SAUSSURE & ZEHNTNER, 1894)

Bactromantis virga SCUDDER, 1896

Bantia STÅL, 1877

Bantia chopardi (GIGLIO-TOS, 1915)

Bantia fusca CHOPARD, 1912

Bantia marmorata SAUSSURE & ZEHNTNER, 1894

Bantia metzi BEIER, 1935

Bantia michaelisi BEIER, 1935

Bantia nana (PIZA, 1969)

Bantia pygmaea (SAUSSURE, 1872)

Bantia wernerii CHOPARD, 1914
 Bantia yotocoensis SALAZAR, 2004

Bantiella GIGLIO-TOS, 1915

Bantiella columbina GIGLIO-TOS, 1915
 Bantiella fusca GIGLIO-TOS, 1915
 Bantiella hyalina BEIER, 1942
 Bantiella pallida GIGLIO-TOS, 1915
 Bantiella trinitatis GIGLIO-TOS, 1915

Diabantia GIGLIO-TOS, 1915

Diabantia minima GIGLIO-TOS, 1915
 Diabantia perparva (PIZA, 1973)

Oligonicella GIGLIO-TOS, 1915

Oligonicella agudeloi SALAZAR & ARIZA, 2005
 Oligonicella bolliana (SAUSSURE & ZEHNTNER, 1894)
 Oligonicella brunneri (SAUSSURE, 1871)
 Oligonicella punctulata (SAUSSURE & ZEHNTNER, 1894)
 Oligonicella scudderii (SAUSSURE, 1870)
 Oligonicella striolata (SAUSSURE & ZEHNTNER, 1894)
 Oligonicella tessellata (SAUSSURE & ZEHNTNER, 1894)

Oligonyx SAUSSURE, 1869

Oligonyx bicornis SAUSSURE, 1869
 Oligonyx bidens (SAUSSURE & ZEHNTNER, 1894)
 Oligonyx dohrnianus (SAUSSURE & ZEHNTNER, 1894)
 Oligonyx insularis BONFILS, 1967
 Oligonyx maya (SAUSSURE & ZEHNTNER, 1894)

Pseudomusonia WERNER, 1909

Pseudomusonia fera (SAUSSURE & ZEHNTNER, 1894)
 Pseudomusonia lineativentris (STÅL, 1877)
 Pseudomusonia maculosa (CHOPARD, 1912)
 Pseudomusonia rapax (SAUSSURE & ZEHNTNER, 1894)

Thesprotiella GIGLIO-TOS, 1915

Thesprotiella bicorniculata BEIER, 1942
 Thesprotiella festae (GIGLIO-TOS, 1898)
 Thesprotiella fronticornis CHOPARD, 1916
 Thesprotiella peruana BEIER, 1935

Thrinaconyx SAUSSURE, 1892

Thrinaconyx fumosa SAUSSURE & ZEHNTNER, 1894
 Thrinaconyx kirschianus SAUSSURE & ZEHNTNER, 1894

Pogonogasterini BEIER, 1935

Carrikerella HEBARD, 1922

Carrikerella ceratophora HEBARD, 1922
 Carrikerella empusa REHN, 1935

Liguanea REHN & HEBARD, 1938

Liguanea pediodromia REHN & HEBARD, 1938

Mantellias WESTWOOD, 1889

Mantellias pubicornis WESTWOOD, 1889

Mantillica WESTWOOD, 1889

Mantillica beieri KALTENBACH, 1957

Mantillica nigricans WESTWOOD, 1889

Mantillica sialidea WESTWOOD, 1889

Pogonogaster REHN, 1918

Pogonogaster latens HEBARD, 1919

Pogonogaster tristani REHN, 1918

Pseudopogonogaster BEIER, 1942

Pseudopogonogaster iguaquensis CARREJO & SALAZAR, 2002

Pseudopogonogaster mirabilis BEIER, 1942

Pseudopogonogaster muscosa SALAZAR, 2000

Thesprotia STÅL, 1877

Thesprotia alvarengai BREGANTE, 1969

Thesprotia brevis GIGLIO-TOS, 1915

Thesprotia caribea REHN & HEBARD, 1938

Thesprotia filum (LICHENSTEIN, 1796)

Thesprotia fuscipennis SAUSSURE & ZEHNTNER, 1894

Thesprotia gigas GIGLIO-TOS, 1915

Thesprotia graminis (SCUDDER, 1877)

Thesprotia infumata (AUDINET-SERVILLE, 1839)

Thesprotia insolita REHN, 1935

Thesprotia macilenta SAUSSURE & ZEHNTNER, 1894

Thesprotia maculata GIGLIO-TOS, 1915

Thesprotia pellucida GIGLIO-TOS, 1915

Thesprotia simplex GIGLIO-TOS, 1915

Thesprotia subhyalina (SAUSSURE, 1870)

Pseudomiopteriginae GIGLIO-TOS, 1919**Anamiopteryx GIGLIO-TOS, 1915**

Anamiopteryx borellii GIGLIO-TOS, 1915

Anamiopteryx grandis BEIER, 1935

Anamiopteryx tuberculata (REHN, 1920)

Eumiopteryx GIGLIO-TOS, 1915

Eumiopteryx bicentenaria (PIZA, 1967)

Eumiopteryx laticollis GIGLIO-TOS, 1915

Eumiopteryx magna JANTSCH, 1991

Leptomiopteryx CHOPARD, 1912

Leptomiopteryx argentina BEIER, 1930
Leptomiopteryx dispar CHOPARD, 1912

Pizaia TERRA, 1982

Pizaia seabrai (PIZA, 1961)

Pseudomiopteryx SAUSSURE, 1870

Pseudomiopteryx amazonensis PIZA, 1968
Pseudomiopteryx bogotensis bogotensis SAUSSURE, 1870
Pseudomiopteryx bogotensis gorgonae ARIZA & SALAZAR, 2005
Pseudomiopteryx columbica GIGLIO-TOS, 1915
Pseudomiopteryx decipiens GIGLIO-TOS, 1915
Pseudomiopteryx festae (GIGLIO-TOS, 1898)
Pseudomiopteryx guyanensis CHOPARD, 1912
Pseudomiopteryx infuscata SAUSSURE & ZEHNTNER, 1894
Pseudomiopteryx maculata BEIER, 1942
Pseudomiopteryx meridana GIGLIO-TOS, 1915
Pseudomiopteryx spinifrons SAUSSURE, 1870

Thespinae SAUSSURE, 1869**Eumusonia GIGLIO-TOS, 1916**

Eumusonia intermedia PIZA, 1973
Eumusonia livida (AUDINET-SERVILLE, 1839)
Eumusonia viridis GIGLIO-TOS, 1916

Galapagia SCUDDER, 1893

Galapagia amazonica TERRA, 1982
Galapagia peruana BEIER, 1935
Galapagia solitaria SCUDDER, 1893

Macromusonia HEBARD, 1922

Macromusonia conspersa (SAUSSURE, 1870)
Macromusonia major (SAUSSURE & ZEHNTNER, 1894)

Musonia STÅL, 1877

Musonia boliviana BEIER, 1930
Musonia chocoensis SALAZAR, 2002
Musonia costalis REHN, 1920
Musonia lineata (CHOPARD, 1912)
Musonia maculata BEIER, 1942
Musonia seclusa (REHN, 1913)
Musonia sexdentata BEIER, 1942
Musonia surinama (SAUSSURE, 1869)

Musoniella GIGLIO-TOS, 1916

Musoniella affinis PIZA, 1961
Musoniella argentina (SAUSSURE, 1870)
Musoniella brasiliensis GIGLIO-TOS, 1916
Musoniella chopardi GIGLIO-TOS, 1916

Musoniella fragilis (PIZA, 1965)
Musoniella ipiranga REHN, 1918
Musoniella laevithorax (CHOPARD, 1916)
Musoniella longicauda PIZA, 1969
Musoniella parva BEIER, 1935

Musoniola GIGLIO-TOS, 1917

Musoniola conservatrix TERRA, 1982
Musoniola dohrniana (SAUSSURE & ZEHNTNER, 1894)
Musoniola plurilobata MELLO-LEITAO, 1937
Musoniola venezuelana TERRA, 1982
Musoniola vicina GIGLIO-TOS, 1917

Paramusonia REHN, 1904

Paramusonia cubensis (SAUSSURE, 1869)

Thespis AUDINET-SERVILLE, 1831

Thespis exposita BEIER, 1963
Thespis major (GIGLIO-TOS, 1916)
Thespis media (GIGLIO-TOS, 1916)
Thespis metae HEBARD, 1922
Thespis pacifica SALAZAR, 2002
Thespis parva (DRURY, 1773)

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Contribution to the Entomofauna of Dibeen Forest Reserve in Jordan

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A baseline insect survey of the Dibeen Forest Reserve was conducted from 26th of March till the 5th of May, 2006. Pitfall traps, light traps and butterfly nets were used for collecting. The collected specimens were preserved in the University of Jordan Insect Museum and Dibeen Forest Reserve. A total of 122 insect species in 11 orders and 42 families were identified. Nine of these species were recorded for the first time from Jordan. Available biological and or ecological data, distribution and relevant remarks about each species are given. Rare, common, pest species, and species that can be used in ecological studies are discussed.

Key words: Dibeen Reserve, Insecta, Insects, Jordan.

Introduction

Dibeen Forest Reserve is considered the only remaining natural Pine-Oak forest in Jordan. It represents the south-easternmost range of Aleppo Pine Natural Forests in the world. The Reserve is located in the northern part of Jordan, about 50 km north of the capital city of Amman. It covers an area of 8 km² (**Fig. 1**). It has humid, cold winter with an average temperature of 9.6 °C. The summer is hot, dry with an average temperature of 27 °C. The average rainfall in the area is around 400 millimetres per year; snow occurs in some years.

The site is part of the western mountain chain overlooking the Jordan Rift Valley with different slopes and Wadis forming a unique landscape. The elevation in the area ranges between 500 and 1100 m above sea level. The forest area can be divided into three major areas according to human uses; natural areas with low human activity, agricultural areas (mainly olive groves), picnicking and public recreation areas with the highest human pressure (**Fig.2**). The forest area is fragmented by a network of roads allowing access to the majority of the area, while only small blocks are still relatively undisturbed. Three main tree stand types occur; Aleppo Pine (*Pinus halepensis*), Pine-Oak (*Pinus halepensis/Quercus calliprinos*), and Oak with small stands of deciduous Oak (*Quercus infectoria*) on the uppermost slopes. Other trees present in the forest include strawberry-trees (*Arbutus andrachne*), pistachio (*Pistacia palaestina*) and wild olive (*Olea europaea*) (**Fig.3**). The ground flora is rich and includes several orchid species. This is a feature of the wadis around the reserve's perimeter (Amr *et al*, 2005).

Since Dibeen Forest is facing several threats including deforestation, uncontrolled grazing, urbanization, woodcutting, pollutions and uncontrolled visitors' activities, a project funded by the Global Environment Facility (GEF) was launched and agreed by the beginning of the year (2004). The agreement was signed between the Royal Society for the Conservation of Nature as an

executing agency and the United Nations Development Program (UNDP) as implementing agency. The project aimed to conserve the natural resources of Dibeen Forest, through sustainable use of the forest, by establishing a nature reserve in Dibeen forest. It also aimed to place guidelines and strategies to ensure the conservation and sustainable use of the biodiversity in the forest area. One of the objectives of the project was to conduct a biodiversity inventory of the flora and the fauna of the reserve. Therefore, several faunal and floral baseline surveys were conducted to assess the biological status of the area during the 2004 and 2005. A survey for the macro-invertebrates of the reserve was conducted to complete these surveys. The survey objectives were to prepare a preliminary macro-invertebrate species of the reserve and to establish a reference collection with representative specimens preserved in both the University of Jordan Insects Museum and Dibeen Reserve. In this paper, only members of class Insecta are presented and other groups will be treated under separate paper.

Materials and Methods

The baseline survey was conducted from 26th of March till the 5th of May, 2006. However, few specimens were collected till mid June. Two collecting rounds were conducted every day from 9:00-11:00am, and from 1:00-3:00pm. Butterflies nets were used to collect flying and resting insects. A fixed light trap was used for 12 nights. In addition, 10 portable trapping nights (from 8:00 and 11:00 pm) were conducted during the survey. Sites were selected to cover different parts in the reserve depending on the accessibility in the reserve (**Figs. 4, 5**). A set of 16 pitfall traps (12 cm diameter, 12 cm deep) were arranged in a grid of approximately 4 m (depending on the topography of the land). One set was placed in each vegetation type (**Fig.6**). About 100-200 ml of apple or white vinegar was used as an attractant. Specimens were taken from the traps daily, except for the last two weeks of the survey; they were taken twice a week.

Results and Discussion

A total of 122 insect species in 11 orders and 42 families were identified from the Dibeen Forest Reserve in this survey. For each species, the name, material collected (the dates followed by number of specimens collected between brackets), and vegetation type from which the specimens were collected, were given. The dates were arranged chronologically. Only the day and month were mentioned since all specimens were collected in 2006. Data about the species distribution and available biological or ecological data, either from our field observations or from literature, were discussed after the material section.

Class Insecta

Order Odonata

A total of 47 species of Odonata occur in the different parts of Jordan (Katbeh-Bader *et al.* 2002). The following two species, collected from the reserve, are believed to be migrating from the nearby aquatic habitats, such as small streams or small agricultural pools.

Family Libellulidae

***Orthetrum chrysostigma* (Burmeister, 1839)**

Material: Near the reserve gate, 17.V (1) and 23.V (1).

This species occurs in Africa including the Sahara, Arabian Peninsula, Iraq, Iran, the Levant, Anatolia and Afghanistan. The ability of the larvae to adapt to arid conditions and aestivate in damp soils enabled this dragonfly to become widely distributed in arid areas (Dumont 1991). It is a common species all over Jordan (Katbeh-Bader *et al.* 2002).

Trithemis arteriosa* (Burmeister, 1839)*Material:** Near the reserve gate, 23.V (1).

This species occurs in the whole of Africa, where it is one of the most common dragonflies, Sinai, the Levant, Saudi Arabia, Iran and Iraq (Dumont, 1991). It is one of the most common dragonflies in Jordan. It is very successful in colonizing small irrigation pools scattered in many small farms in the upper lands and semi-desert areas (Katbeh-Bader *et al.* 2002).

Order Orthoptera**Family Acrididae**

Amr *et al.* (1996) reported seven species of the short-horned grasshoppers from Al Azraq Oasis in the eastern desert of Jordan. Katbeh-Bader (2001) recorded 49 species and subspecies from Jordan. In this survey, the following four species were collected.

Acinipe davisi* (Uvarov, 1949)*Material:** 22. V (1). Pine vegetation area.

This species occurs in Turkey, Syria and Palestine. It is recorded from Jordan for the first time. It appears to be rare since it was not collected during the last several years during a survey of grasshoppers in the different parts of Jordan (Katbeh-Bader, 2001). The collected specimen was jumping in an open, pine trees area, camouflaged with the ground. Further observations are needed to verify the population status in the reserve, and determine its hosts and biology.

Acrotylus insubricus* (Scopoli, 1786)*Material:** 29.III (2). Pine vegetation area.

This species is found in North Africa, South Europe to Turkey, Caucasus, south central Asia, and the Middle East (Fishelson, 1985). It is one of the most common species in Jordan found on soil with sparse vegetation (Katbeh-Bader, 2001).

Oedipoda aurea* Uvarov, 1923*Material:** 22. V (2), 25. V (1), 6. VI (1). Collected from pine and mixed vegetation area.

This species is found in Turkey and the Middle East. It is a typical highland species, found on dry mountain slopes, usually found in bushy areas (Fishelson, 1985).

Tmethis pulchripennis asiaticus* Uvarov, 1943*Material:** 18. IV (1). Pine-trees vegetation area.

This grasshopper is found from western Iran to Sinai. It may be found in arid habitats as well as in areas with dense vegetation (Fishelson, 1985).

Family Gryllidae***Gryllopsis hebraeus* (Saussure, 1877)****Material:** 17. IV (1), 19. IV (5), 30. IV (1), 2. V (1), 4. V (3), 17. V (1), 18. V (1), 23. V (3), 30. V (1), 5. VI (1). Collected from Pine, Oak and mixed vegetation area.

Known from Palestine and Jordan (Eades & Otte, Orthoptera Species File Online). It was found to be a common species at the reserve usually hiding under stones.

Gryllodes* sp.*Material:** 11. IV (2), 19. IV (4), 23. IV (2). Collected from Oak and Pine vegetation area.

Specimens were found in pitfall traps placed in the Oak trees area, which represents the highest elevation in the reserve. They were also collected from beneath stones.

Family Tettigoniidae

Katbeh-Bader and Massa (2001) recorded 20 species of the long-horned grasshoppers and described two new species from Jordan. Mahasneh and Katbeh-Bader (2004) conducted a detailed study on this group provided with keys and photographs. A total of seven species were recorded at the reserve area.

***Eupholidoptera palaestinensis* (Ramme, 1939)**

Material: 11. IV (1). Mixed vegetation area.

This species is found in Jordan and Palestine (Mahasneh and Katbeh-Bader, 2004). The only collected specimen was found in a pitfall trap in the mixed vegetation area of the reserve.

***Isophya savignyi* Brunner von Wattenwyl, 1878**

Material: 30. III (1). Oak vegetation.

This species is distributed in Jordan, Palestine, Lebanon and Turkey. This species appears between January and May. It is common among low vegetation. (Mahasneh and Katbeh-Bader, 2004). The specimen was found in the pitfall trap.

***Platycleis (Decorana) buxtoni* (Uvarov, 1923)**

Material: 19. IV (1), 1. V (1), 10. V (1), 14. V (1), 16. V (1). Pine vegetation.

This species is found in Jordan and Palestine. Usually appears between April and July, inhabits bushes or grasses (Mahasneh and Katbeh-Bader, 2004).

***Platycleis (Platycleis) intermedia* (Serville, 1838)**

Material: 16. V (1). Pine vegetation area.

This species is widespread and common all over the Mediterranean region, Central Europe, and as far east as China. It is common in the uncultivated places and in areas cultivated with cereals (Mahasneh and Katbeh-Bader, 2004).

***Tettigonia* sp.**

Material: 8. V (1). Pine vegetation.

The collected specimen was too young to be identified to the species level.

***Tettigonia caudata* (Charpentier, 1845)**

Material: 8. V (1). Pine vegetation.

This species is distributed in Jordan, Palestine, Syria, Iraq, Iran, Turkey, Cyprus, Caucasus, and from central Europe to the Balkans. It has a good flying ability but for short distances (Mahasneh and Katbeh-Bader, 2004).

***Tettigonia viridissima* (Linnaeus, 1758)**

Material: 8. V (1). Mixed vegetation.

It is found in the whole Palearctic region. In the Middle East, it was recorded from Palestine, Iraq and Turkey. This species is carnivorous and attacks many insect species such as flies, acridines, butterflies, and caterpillars (Mahasneh and Katbeh-Bader, 2004).

***Tylopsis lilifolia* (Fabricius, 1793)**

Material: 25. V (1). Pine vegetation.

It has a southern Mediterranean distribution, in S. Europe, N. Africa, and W. Asia. In the Middle East, it was recorded from Palestine, Jordan, Lebanon, Syria, Turkey, Iran, and Arabia. Specimens from Jordan belong to the deserticolous form. The favorite habitats are sunlit grassy places, or dry mountain slopes overgrown with grass or shrubs, and it prefers the young seedling leaves. It can be found in almost all months of the year but most common in the spring (Mahasneh and Katbeh-Bader, 2004). The specimen was found in the light trap.

Order Mantodea**Family Empusidae*****Empusa fasciata* Brullé, 1836**

Material: 1. V (1), 2. V (1). Pine vegetation.

Known from Algeria, Asia Minor, Crete, Cyprus, Egypt, Greece, India, Iran, Jordan, Slovenia, Palestine, Romania and Turkey. *Empusa fasciata* is common in Jordan. It was collected from *Ononis spinosa*, *Ononis natrix*, *Sarcopoterium spinosum*, *Varthemia iphionoides*, *Balluta undulata* and *Fumaria densiflora*. The nymphs of *Empusa fasciata* have a striking mimicry to the pink flowers of *Fumaria densiflora* (Abu-Dannoun and Katbeh-Bader (2007)). One of our specimens was found camouflaged on *Stipa capensis* and the other specimen was attracted to a light trap where it came to feed on attracted insects.

Family Mantidae***Ameles syriensis* Giglio-Tos, 1915**

Material: 4. V (1), 8. V (1), 16. V (1), 18. V (1), 23. V (1), 24. V (1), 28. V (1). Pine vegetation.

This species is found in Jordan, Syria and Turkey. It appears to be endemic to the Levant. It is widely distributed in Jordan. *A. syriensis* was observed on *Artemisia inculata*, *Centaurea iberica*, *Varthemia iphionoides*, *Cirsium alatum* and *Carlina tenuis* (Abu-Dannoun and Katbeh-Bader (2007)). Some of our specimens were collected attracted to light traps.

***Rivetina byblica* La Greca and Lombardo, 1982**

Jordan, Palestine, Syria and Turkey.

Material: 16. V (3). Mixed vegetation. 26. V (1). Pine vegetation. 30. V (1). Oak, Pine and mixed vegetation.

Rivetina byblica was described for the first time from Wadi Shu'ayb by La Greca & Lombardo (1982). It was incorrectly recorded under the name *Rivetina baetica* by Uvarov (1923). It is widely distributed in all phytogeographical zones of Jordan. Early nymphs of this species mimic ants in color and behavior. Most specimens were found on the ground, but some were collected from *Sarcopoterium spinosum* and *Ononis natrix*. Some also were found under street lights (Abu-Dannoun and Katbeh-Bader (2007)).

All of our specimens were collected by hand except one specimen, which was found in the Oak trees area fallen in the pitfall traps apparently trying to catch fallen insects.

Order Blattaria**Family Blattellidae*****Blatta orientalis* Linnaeus, 1758**

Material: 19. IV (1), 2. V (2), 4. V (1), 14. V (1), 16. V (1). Pine and Oak vegetation.

The Oriental Cockroach is nearly cosmopolitan in distribution. Males are winged, females have abbreviated wings. They may be found in houses or in the wild.

Order Dermaptera**Family Forficulidae*****Forficula laurida* Fischer, 1854**

Material: 30. III (4), 11. IV (1), 2. V (1). Pine and Oak vegetation.

Specimens were collected as free catch and in pitfall traps in the oak trees area.

Order Hemiptera**Family Coreidae*****Gonocerus acuteangulatus* (Goeze, 1778)**

Material: 18. V (1), 23. V (1). Pine vegetation.

This Turano-mediterranean species was recorded from only one specimen from Ar Rumaymin near Amman in 1986 (Katbeh *et al.* 2000). It appears to be rare in Jordan.

***Rhyllomorpha laciniata* (Villers, 1789)**

Material: 18. V (1). Pine vegetation.

A Mediterranean species. A rare species in Jordan; only two specimens were collected from Amman in 1988 (Katbeh *et al.* 2000). Our specimen was collected as free catch.

Family Cydnidae***Sehirus melanopterus* (Herrich-Schäffer, 1835)**

Material: 13. IV (1), 18. V (1). Pine vegetation.

Euromediterranean-iranian. Known from many localities in Jordan Valley and the highlands of Jordan (Katbeh *et al.* 2000).

Family Lygaeidae***Lethaeus cibratissimus* (Stål, 1858)**

Material: 12. IV (1). Mixed vegetation.

An East-mediterranean species. Recorded previously from several localities in Jordan Valley and the highlands of Jordan (Katbeh *et al.* 2000).

***Spilostethus pandurus* (Scopoli, 1763)**

Material: 2. V (2), 25. V (1). Pine vegetation.

This species is Paleotropical element extending to the Ponto-Mediterranean region. It is one of the most common species of Hemiptera in Jordan.

Family Pentatomidae***Acrosternum heegeri* Fieber, 1861**

Material: 23. V (8), 25. V (6), 28. V (5). Pine vegetation.

A Turano-mediterranean species. Known from many localities in Jordan Valley and the highlands of Jordan (Katbeh *et al.* 2000).

Family Reduviidae***Raphidosoma lutesceum* Poppius, 1911**

Material: 6. VI (1). Mixed vegetation.

Species with a restricted Syro-Arabian distribution. In Jordan, it was recorded only from Al Muwaqqar and Thiban (Katbeh *et al.* 2000).

***Rhynocoris iracundus* (Poda, 1761)**

Material: 16. III (1), 2. V (3), 18. V (1), 23. V (1), 25. V (1). Pine vegetation.

This is a widespread Centralasian-euromediterranean element. One of the specimens was seen hunting a honey bee and feeding on it.

Family Rhopalidae

***Corizus hyoscyami* (Linnaeus, 1758)**

Material: 18. V (1). Pine vegetation.

This is a common and widespread Palearctic species (Katbeh *et al.* 2000).

Family Scutelleridae

***Eurygaster integriceps* Puton, 1881**

Material: 23. V (1). Pine vegetation.

An East-Mediterranean-turanian species. A known pest of cereals.

Order Neuroptera

Family: Chrysopidae

***Chrysoperla carnea* (Stephens, 1836)**

Material: 1. V (3), 15. V (1), 23. V (4). Pine vegetation.

This is the green lacewings, a well known Holarctic predator of aphids. All collected specimens were attracted to the light trap.

Family Hemerobiidae

***Hemerobius* sp.**

Material: 2. V (1). Pine vegetation.

The specimens was attracted to the light trap.

Order Coleoptera

Family: Carabidae

***Acinopus (Acinopus) picipes* Olivier, 1795**

Material: 19. IV (1). Pine vegetation.

This species occurs in Europe; East Palearctic; Near East (Asian Turkey, Caucasian Russian republics, Georgia, Armenia, Azerbaijan, Lebanon, Syria, Palestine, Jordan, Sinai Peninsula (Egypt), Arabian Peninsula, Iran, and Iraq).

It appears to be rare in the reserve since only a specimen was collected as free catch. Further research is needed to find out its status.

***Calathus syriacus* Chaudoir, 1863**

Material: 28. III (4), 29. III (3), 30. III (1), 11. IV (4), 12. IV (4), 17. IV (13), 20. IV (9), 23. IV (3), 30. IV (3), 2. V (2), 3. V (22), 4. V (2), 7. V (10), 10. V (13), 14. V (11), 17. V (39), 23. V (11), 29. V (1), V (18), 5. VI (11). All areas.

This species is A South-West Asiatic species. It was found to be the most common species in the reserve. Its population may be studied periodically (every few years) because species of Carabidae are known as good indicators for the ecosystem and its population changes may reflect changes in the environment. The number of specimens collected in the pitfall traps were as follows: 104 in the Strawberry trees area, 59 in the Oak trees area, 10 in the Pine trees area and seven specimens in the mixed vegetation area. Four specimens were collected as free catch and only one specimen was found in the light traps.

***Calathus (Neocalathus) cinctus* Motschulsky, 1850**

Material: 30. V (1). Strawberry vegetation.

It is found in the East Palaearctic; Near East (Asian Turkey, Caucasian Russian republics, Georgia, Armenia, Azerbaijan, Lebanon, Syria, Palestine, Jordan, Sinai Peninsula (Egypt), Arabian peninsula, Iran, Iraq; and North Africa.

The single specimen was found in a Pitfall Trap in Strawberry vegetation area.

Carabus (Lamprostus) hemprichi Dejean, 1826

Material: 28. III (2), 29. III (2), 11. IV (10), 17. IV (8), 20. IV (6), 23. IV (4), 26. IV (1), 30. IV (2), 3. V (4), 7. V (3), 14. V (4), 17. V (5), 23. V (5), 30. V (4). All areas.

This species is found in Lebanon, Palestine, Syria and Turkey. It is recorded from Jordan for the first time. Individuals of this species appeared to be the third the numbers collected in the reserve. All specimens were collected in the pitfall traps; 37 specimens were collected from the Oak trees area, 14 specimens from the Strawberry trees area, seven specimens from the Mixed vegetation area and two from the Pine trees area. It could be studied as mentioned under above under *Clathus syriacus*.

Carterus (Pristocarterus) angustipennis (Chaudoir, 1852)

Material: 12. IV (1). Strawberry vegetation.

East Palaearctic; Near East (Asian Turkey, Caucasian Russian republics, Georgia, Armenia, Azerbaijan, Lebanon, Syria, Palestine, Jordan, Sinai Peninsula (Egypt), Arabian peninsula, Iran, and Iraq)

The single specimen was collected during as a free catch.

Cryptophonous tenebrosus (Dejean, 1829)

Material: 23. V (5). Pine vegetation.

This species is distributed in East Palaearctic; Near East (Asian Turkey, Caucasian Russian republics, Georgia, Armenia, Azerbaijan, Lebanon, Syria, Palestine, Jordan, Sinai Peninsula (Egypt), Arabian Peninsula, Iran, Iraq; and in North Africa

Field notes: All specimens were collected during the Moth Trap Method.

Laemostenus (Laemostenus) quadricollis L. Redtenbacher, 1843

Material: 11. IV (1), 17. IV (2), 2. V (2), 17. V (2). All areas except Pine vegetation.

Cyprus and Near East (Asian Turkey, Caucasian Russian republics, Georgia, Armenia, Azerbaijan, Lebanon, Syria, Palestine, Jordan, Sinai Peninsula (Egypt), Arabian peninsula, Iran, Iraq). Specimens were collected from all areas selected for the Pitfall Traps except the Pine trees area. Some specimens were collected as free catch.

Laemostenus (Laemostenus) venustus Dejean, 1828

Material: 28. III (1), 20. IV (1). Oak vegetation.

Europe (Albania, Bulgaria, Croatia, France, Greece, Italy, Romania, Slovenia; Near East (Asian Turkey, Caucasian Russian republics, Georgia, Armenia, Azerbaijan, Lebanon, Syria, Palestine, Jordan, Sinai Peninsula (Egypt), Arabian Peninsula, Iran, and Iraq).

Field notes: The specimens were collected from the Oak trees area using the Pitfall Traps Method.

Laemostenus (Sphodroides) cordicollis Chaudoir, 1854

Material: 11. IV (1), 20. IV (1), 30. V (1). Oak vegetation.

Distributed in the Near East (Asian Turkey, Caucasian Russian republics, Georgia, Armenia, Azerbaijan, Lebanon, Syria, Israel, Jordan, Sinai Peninsula (Egypt), Arabian peninsula, Iran, Iraq) and in North Africa.

Field notes: All specimens were collected from the Oak trees area in the Pitfall Traps Method.

Nebria hemprichi Klug, 1832

Material: 29. III (2), 11. IV (23), 12. IV (4), 17. IV (9), 18. IV (1), 20. IV (13), 23. IV (2), 26. IV (3), 30. IV (1), 2. V (1), 3. V (3), 4. V (1), 7. V (52), 10. V (5), 14. V (6), 17. V (3), 23. V (10), 26. IV (1), 30. V (6), 5. VI (2). From all areas.

It occurs in Iran, Palestine, Syria and Turkey. New to Jordan. This species appeared to be the second most abundant species of Carabidae in pitfall traps in the reserve. Its numbers were 70

specimens in the Oak trees area, 16 specimens from the Strawberry trees area, nine specimens from the Mixed vegetation area and only three specimens from the Pine trees area. Also one specimen was collected using the free catch method. It may be sampled in future studies along with *Calathus syriacus* and *Carabus hemprichi* in order to detect changes in the ecosystem.

***Odontocarus asiaticus* Chaudoir, 1852**

Material: 11. IV (1), 17. IV (1), 19. IV (1), 20. IV (1), 1. V (1), 7. V (1), 10. V (1), 14. V (1), 23. V (1), 30. V (1), 5. VI (1). Oak and Pine vegetation.

Found in Cyprus, Iraq, Jordan, Palestine, Syria and Turkey.

This species is less common than the above species; the species was collected using pitfall traps and as free catch.

Family Cerambycidae

***Arhopalus syriacus* (Reitter, 1895)**

Material: 24. V (1), 28. V (1), 16. VI (2). Pine vegetation. Specimens were collected by the Light Traps.

This species is widespread throughout Mediterranean area (mostly in coastal pine forests), Canari Islands, and Madeira. It is ecologically associated with *Pinus*. In Jordan, it was recorded only from Al Jubayhah near Amman (Sama *et al.* 2002). Dibeen Reserve is its second locality so far.

***Phoracantha semipunctata* (Fabricius, 1775)**

Material: 23. V (1). Pine vegetation. It was collected using the Light Trap.

Originally from Australia, introduced and established throughout the Mediterranean region from Portugal and southern France to Greece Cyprus and Middle East. It is a pest of *Eucalyptus* (Sama *et al.* 2002).

***Prionus besicanus* Fairmaire, 1855**

Material: 25. V (1). Pine vegetation.

This is an eastern Mediterranean species which is distributed from Albania and Greece (including Crete) to the Middle East, Cyprus and Sinai. It is polyphagous on deciduous trees, frequently on fruit plants, also recorded from *Acacia mollissima* and *Ligustrum ovalifolium* (Halperin and Holzschuh, 1993). It was collected from Irbid and Jarash in the north of Jordan and from Dana Reserve in the south (Sama *et al.* 2002).

Family Coccinellidae

***Exochomus* sp.**

2. V (5), 16. V (1), 18. V (4). Pine vegetation.

***Coccinella septempunctata* Linnaeus, 1758**

Material: 2. V (5), 18. V (6).

All specimens were collected as free catch. It was recorded on the flowers of *Cistus* sp.

***Harmonia quadripunctata* (Pontoppidan, 1763)**

Material: 23. V (2). Pine vegetation.

Specimens were collected by a light Trap.

Family: Elateridae

***Lacon* sp.**

Material: 2. V (3). Strawberry vegetation.

The specimen was collected by a Pitfall Trap in the Strawberry trees area.

Family Histeridae***Margarinotus graecus* (Brullé, 1829)**

Material: 28. III (1), 29. III (6), 30. III (4), 11. IV (13), 12. IV (5), 17. IV (7), 19. IV (1), 20. IV (7), 23. IV (3), 26. IV (4), 30. IV (1), 2. V (4), 3. V (11), 4. V (1), 7. V (2), 10. V (3), 11. V (1), 140. V (5), 23. V (2), vegetation. 30. V (4). All areas in the reserve except oak trees area.

Specimens were collected as free catch, but mostly was found in the Pitfall Traps. The highest number of specimens was found to be in the Strawberry-trees area (65 specimens) followed by eight specimens in the mixed vegetation area, six in the Pine trees area, and there were no records for this species in the Oak trees area.

Family Scarabaeidae***Aplidia baraudi* Sabatinelli, 1991**

Material: 16. V (1), 5. VI (1). Pine vegetation.

So far, it is endemic to Jordan known only from Ajloun area. Specimens were collected by portable light trap, and were found in the Pitfall Traps placed in the Pine trees area.

***Aplidia endroedii* Baraud, 1988**

Material: 16. V (1), 17. V (1), 25. V (1), 25. V (1). Pine and mixed vegetation.

Known only from Palestine and Jordan.

***Maladera (Macroserica) syriaca jeraschensis* Baraud, 1990**

Material: 28. III (1), 7. IV (1), 12. IV (3), 17. IV (8), 20. IV (2), 23. IV (1), 26. IV (1), 1.V (1), 3. V (3), 9. V (1), 14. V (1), 18. V (2), 22. V (1), 23. V (5), 30. V (3), 3. VI (1), 5.VI (2). From all areas.

This is a common beetle in the reserve. It was found in the pitfall traps, light traps and was collected from all areas in the reserve by hand or nets.

***Oxytheria noemi* Reiche & Saulcy, 1856**

Material: 19. IV (1). Pine vegetation.

This species is known from Cyprus, Turkey, Syria, Lebanon, Jordan and Palestine.

***Protaetia (Potosia) cuprea* ssp. *ignicollis* Gory and Percheron, 1833**

Material: 3. V (1). Pine vegetation.

The subspecies is found in Turkey, Syria, Lebanon, Iraq, Jordan, Palestine, Egypt and Libya.

Family Tenebrionidae***Adesmia cancellata* Klug, 1830**

Material: 28. III (1), 16. V (3), 23. V (2). Oak and mixed vegetation.

This is a common darkling beetle in Jordan. It is more common in dry areas especially in the deserts. The specimens were collected using as free catch or in the pitfall traps.

***Blaps* sp.**

Material: 28. III (1), 29. III (1), 11. IV (1), 17. IV (1), 19. IV (1), 20. IV (1), 4. V (1), 10. V (1), 14. V (1), 30. IV (2). All areas.

This large species is found usually under stones. Specimens were collected from all areas selected for the Pitfall Traps. Also it was collected to a lesser extent as free catch.

***Gonocephalum* sp.**

Material: 19. IV (1), 26. V (1). Mixed vegetation.

Specimens were collected by pitfall traps and as free catch.

***Pimelia (Pimelia) bajula* Klug, 1830**

Material: 11. IV (1). Pine vegetation.

Found in Cyprus, Iran, Iraq, Jordan, Palestine, Sinai, Syria, and Turkey.
The specimen was found in a pitfall trap.

***Opatriinus niloticus* (Mulsant & Rey 1853)**

Material: 12. IV (1), 17. IV (1). Strawberry vegetation.

One specimen was found in a pitfall trap and the other collected during as free catch.

***Tentyria discicollis* Reiche & Saulcy, 1857**

Material: 17. IV (7), 19. IV (2), 20. IV (1), 23. IV (4), 14. V (1), 17. V (5), 5. VI (4). Strawberry and Mixed vegetation.

Specimens were collected as free catch or in the Pitfall Traps.

***Tentyria rotundata* (Brullé, 1832)**

Material: 29. III (1), 17. IV (7), 19. IV (3), 20. IV (4), 23. IV (1), 26. IV (2), 7. V (1), 10. V (5), 14. V (2), 17. V (6), 23. V (5), 30. V (5), 5. VI (3). All except oak.

This species was found to be common in the reserve. It may be considered as an indicator species. It was collected using as free catch and its numbers in pitfall traps were 19 specimens in the mixed vegetation area, 13 specimens in the Strawberry trees area and six specimens in the Pine trees area. Its population may be studied along with other Carabidae in the reserve.

***Zophosis punctata* Brullé, 1832**

Material: 14. V (1). Pine vegetation.

North Africa from Morocco to Libya, Europe from Spain to Greece, Asia, from Turkey to Pakistan and Saudi Arabia. The collected specimen was found a pitfall trap.

Order Diptera

Family: Asilidae

***Machimus* sp.**

Material: 18. IV (1), 2. V (2), 4. V (2), 8. V (1). Pine vegetation.

All specimens were collected by butterfly net.

***Machimus funebris* Theodor, 1980**

Material: 18. V (1). Pine vegetation.

Known from Palestine. It is new to the fauna of Jordan.

***Promachus mustela* Loew, 1854**

Material: 23. V (1). Pine vegetation.

Occurs in Palestine and Syria. New to Jordan.

***Oligopogon* sp.1**

Material: 16. V (1). Pine vegetation.

***Oligopogon* sp. 2**

Material: 2. V (1). Pine vegetation.

***Stenopogon* sp.**

Material: 23. V (2). Pine vegetation.

A Mating pair was collected using the hand net.

Family: Calliphoridae

***Lucilia sericata* (Meigen, 1826)**

Material: 3. V (1). Strawberry vegetation.

Field notes: It was collected from the Pitfall Trap Method in the Strawberry-tree area

Family: Syrphidae

***Episyrphus balteatus* (De Geer, 1776)**

Material: 18. V (1). Mixed vegetation.

Widespread throughout all continents.

***Eristalis tenax* (Linnaeus, 1758)**

Material: 16. V (1). Pine vegetation.

It has a worldwide distribution. Intestinal myiasis due to the larvae of this species fly was reported sporadically from various countries and is briefly mentioned in major textbooks of tropical medicine and parasitology (Aguilera *et al.* 1999).

***Eristalodes taeniops* Weidemann, 1818**

Material: 16. V (1). Pine vegetation.

It is found in the Mediterranean region, North Africa, and West Asia.

***Scaeva* sp.**

Material: 8. V (1). Mixed vegetation.

***Sphaerophoria scripta* (Linnaeus, 1758)**

Material: 18. V (1). Mixed vegetation.

Found in the entire Holarctic region.

Family: Tabanidae

***Tabanus lunatus* Fabricius, 1794**

Material: 18. V (1). Pine vegetation.

It is a Mediterranean species recorded from Europe, near and Middle East as well as from Central Asia and North Africa. Al-Talafha *et al.* (2005) recorded this species from 3 undated specimens from Amman and Al Balqa. The Host animal is unknown.

***Tabanus regularis* Jaennicke, 1866**

Material: 23. V (7). Pine vegetation.

Host animals are horses, cows and monkeys. This species is restricted to forested areas (Al-Talafha *et al.* 2005)

Family: Tipulidae

***Tipula* sp.**

Material: 30. III (2), 20. IV (1), 2. V (2). Pine vegetation.

It was collected as free catch, by sweeping net or in light trap.

Order Lepidoptera

(Butterflies)

Family Hesperiidae

***Carcharodus orientalis maccabaeus* Hemming, 1932**

Material: 8. V (1). Pine vegetation.

The Oriental Marbled Skipper occurs in the Levant. In Jordan, it is found in the Mediterranean zones and the fringes of the eastern dessert. It has three broods. It prefers dry wadis. Food plant

may be *Phlomis*, *Ballota* and related species (Larsen and Nakamura, 1983). Its food plant in the reserve needs to be identified.

***Spialia orbifer hilaris* Staudinger, 1901**

Material: 8. V (1), 10. V (1). Pine vegetation.

The Orbiferous Skipper occurs in a series of subspecies in former Yugoslavia, the Middle East, Russia, western China and Korea. In Jordan, it is confined to the northern Mediterranean zone. Larsen & Nakamura (1983) stated that two broods are produced, one in early April and the second in July. The food plant in Jordan is not known.

***Thymelicus sylvestris syriaca* Tutt, 1905**

Material: 19. IV (1), 1. V (1), 8. V (1), 25. V (1). Pine vegetation.

It is found from North Africa, throughout most of Europe to Asia Minor and the Levant. The subspecies *syriaca* is a subspecies found from Balkans to the Levant. In Jordan, it is common in the northern Mediterranean zone and it descends as low as sea level in the Jordan Valley. It was recorded also from Petra. The food plants are species of grasses (Larsen and Nakamura, 1983).

Family Lycaenidae

***Lampides boeticus* Linnaeus, 1767**

Material: 8. V (1). Pine vegetation.

The Long-tailed Blue is widely distributed in the Paleotropics from which it migrates to Palearctic region. It is found virtually in all types of habitats in Jordan. Larsen (1974) stated that it feeds on a wide range of legume species.

***Polyommatus icarus zelleri* Verity, 1919**

Material: 8. V (2), 14. V (1). Pine vegetation.

The Common Blue is common in North Africa, Europe, the Middle East and most of temperate Asia. It is the most common lycaenid in Jordan, inhabiting a wide range of habitats.

Family Nymphalidae

***Limenitis reducta schiffermuelleri* Higgins, 1933**

Material: 4. V (1). Mixed vegetation.

The Southern White Admiral is found in southern and central Europe to Iran. It is a rare species in Jordan. Larsen & Nakamura (1983) mentioned that only two records of this species were known from Jordan (Dibeen and Jarash). Rasun represents a third locality. All of these localities are in the northern Mediterranean zone to which the species appears to be limited. It feeds on *Lonicera* sp. Except for scientific research, collecting this butterfly should be prohibited from the reserve as well as other parts of Jordan.

***Vanessa atalanta* (Linnaeus, 1758)**

Material: 4. V (1). Mixed vegetation.

The Red Admiral is a migrant species that occurs in the Holarctic region. It is a scarce species in Jordan, mostly recorded from the northern Mediterranean zone but may be found in the Jordan Valley. The food plant is *Parietaria* and *Urtica pilulifera*. Dibeen is one of the few places from which it was collected. Only one specimen was collected from the reserve; another specimen was seen on *Cistus* flower. This species should be protected with other rare species in the reserve.

***Vanessa cardui* (Linnaeus, 1758)**

Material: 8. V (1). Mixed vegetation.

The Painted Lady is a migrant butterfly distributed worldwide except most of South America. It occurs in all parts of Jordan all months of the year. Large numbers were observed migrating in north or northwestern direction in February 1997 in Wadi Arabah and in the Jordan Valley. However, later in the season they were seen migrating in southern or southeastern direction. Amr

et al. (1996) found this species to be common in Al Azraq Reserve. The only specimen was collected from the spiny flower of *Echinops*.

***Melitaea deserticola macromaculata* Belter, 1934**

Material: 29. III (1), 18. IV (1), 25. V (1). Pine and mixed vegetation.

The Desert Fritillary occurs in North Africa and the Levant. It is found in the Mediterranean zones of Jordan, the fringes of the Jordan Valley and the southern desert. Larvae feed on species of Scrophulariaceae (Larsen & Nakamura, 1983).

***Melitaea phoebe telona* Fruhstorfer, 1908**

Material: 8. V (1). Pine vegetation.

The Knapweed Fritillary occurs from North Africa and Spain to Korea. In Jordan, it was thought to inhabit the Mediterranean zones only, however, Fabiano (1998) recorded specimens from the arid granite mountains (southern desert) overlooking the town of Aqaba.

Family Pieridae

***Anthocharis cardamines phoenissa* von Kachberg, 1894**

Material: 30. III (3). Mixed vegetation.

The Orange Tip is found from Western Europe, temperate Asia to Japan. It was recorded by Larsen & Nakamura (1983) based on Trevor Trought's field notes. Its occurrence was also confirmed by Katbeh-Bader (1998, 2003). This species is quite common in Lebanon and Palestine. Only three specimens were found at the reserve area and were flying in a group.

***Aporia crataegi augustior* Graves, 1925**

Material: 19. IV (1). Mixed vegetation.

The Black-veined White is widely distributed in the Palaearctic region. In Jordan, it is common in the mountainous areas and along the Jordan Valley. Larvae feed on *Crataegus*, *Prunus dulcis* (Almond) and other Rosaceae where they may become pests.

***Artogeia rapae leucosoma* Schawerda, 1905**

Material: 29. III (1), 30. III (6), 12. IV (1), 13. IV (1), 19. IV (4), 1. V (2), 3. V (2), 8. V (3), 16. V (1), 18. V (1), 23. V (1). Pine, Oak and mixed vegetation areas.

The Small White is a migratory butterfly found throughout the Palaearctic Region and as an introduced species in North America, Australia and New Zealand. It was collected all-year round, and populations in the Jordan Valley have several broods. Amr *et al.* (1996) reported that it was one of the most common species found in Al Azraq Reserve. In Dibeen Reserve, it was seen almost in all of the reserve area either flying or on flowers such as *Centaurea*.

***Colias crocea crocea* Geoffroy, 1785**

Material: 8. V (2), 10. V (1). Pine and mixed vegetation.

The Clouded Yellow is common in North Africa, Europe and the Middle East. In Jordan, it is common throughout the Mediterranean and the Irano-Turanian zones. It has several broods that fly all-year round. It feeds on several species of *Vicia*. Amr *et al.* (1996) found it common near cultivated alfalfa (*Medicago sativa*) in Al Azraq Reserve.

***Euchloe ausonia melisande* Fruhstorfer, 1908**

Material: 19. IV (1). Pine vegetation.

The *E. ausonia* complex is found all around the Mediterranean and in Asia Minor. The Dappled White is common in the Mediterranean zones of Jordan. It feeds on *Brassica* and *Sinapis* (Brassicaceae).

***Gonepteryx cleopatra taurica* Staudinger, 1881**

Material: 30. III (3), 19. IV (1), 20. IV (1), 4. V (1), 16. V (1). Pine vegetation.

The Cleopatra is a typical Holo-Mediterranean species. In Jordan, It was reported from several localities within the northern Mediterranean zone (Larsen & Nakamura, 1983). Very few specimens exist in the University of Jordan Insects Museum. It is a forest-adapted species. Decline in its numbers and distribution may reflect the degradation of forests in Jordan. The larval food plants are *Rhamnus* spp. Dibeen is one of the very few places where this butterfly can be seen in Jordan. Several specimens were found, mostly near the main gate where the area is open with different flowering plants such as Poppy, Star Clover and Orchis.

***Pieris brassicae catoleuca* Röber, 1896**

Material: 30. III (1), 20. IV (1), 4. V (3), 14. V (4), 18. V (4), 23. V (4), 25. V (4). Pine and mixed vegetation.

The Large White is found from North Africa via most of Europe and the Middle East to the Himalayas. It occurs in Chile and South Africa as an introduction. In Jordan, it is a migrant species common in the Mediterranean zones of Jordan from which it penetrates the Jordan Valley. It feeds on several species of family Brassicaceae and *Capparis spinosa* (Capparidaceae). It was seen in almost all reserve areas, flying or resting on the spiny flowers such as *Centaurea*.

***Pontia edusa* (Fabricius, 1777)**

Material: 18. V (1). Pine vegetation.

The Eastern Bath White occurs in the Sahara, most of Europe, India, Central Asia and East Asia. It is one of the most common species inhabiting almost all parts of Jordan except the southern desert. It mainly feeds on a species of the genus *Reseda* (Larsen & Nakamura, 1983). Amr *et al.* (1996) found it associated with areas of *Tamarix* and *Alhagi maurorum* in Al Azraq Reserve.

Family Satyridae

***Hyponephele lupinus centralis* Riley, 1921**

Material: 16. V (2), 18. V (1), 23. V (2). Pine vegetation.

The Oriental Meadow Brown occurs in North Africa, southern Europe, Asia Minor, the Levant, Iran, and Afghanistan. In Jordan, it appears to be limited to the northern Mediterranean zone. It has a single brood in May and June or July. Material in August or September is assumed to be aestivating individuals appearing to oviposit (Larsen & Nakamura, 1983). Larvae feed on grasses.

***Hyponephele lycaon libanotica* Staudinger, 1901**

Material: 16. V (2). Mixed vegetation.

The Dusky Meadow Brown is found in south and eastern Europe. The subspecies is found in Lebanon and Mount Hermon (Syria). It is new to Jordan and appears to be rare. Our specimens were collected at higher elevations at the reserve area reaching up to 979m (a.s.l)

***Kirinia roxelana* Cramer, 1777**

Material: 16. V (2). Oak vegetation.

The Lattice brown is found in South-Eastern Europe and the Near East. It is recorded from Jordan for the first time. It appears to be rare. It was collected from Jabal Al-Aqra in the reserve; the area is characterized by a dense Oak vegetation cover. It was seen taking nectar from the globe thistle, *Echinops spinosissimus*. Further studies should be directed toward finding the food plants for adults and larvae. The food plants in Europe is *Brachypodium* and species of Gramineae

***Lasiommata megera emilyssa* Verity, 1919**

Material: 19. IV (1), 1. V (1), 8. V (1). Pine vegetation.

The Wall Brown is a Holomediterranean species. It was collected in the northern Mediterranean zone of Jordan, but also from Petra in the southern Mediterranean zone. It flies from February to August and probably to October (Larsen & Nakamura, 1983).

***Maniola telmessia telmessia* Zeller, 1847**

Material: 18. IV (1), 19. IV (2), 2. V (1), 3. V (2), 7. V (1), 8. V (6), 14. V (1), 16. V (1), 23. V (3), 25. V (1), 30. V (1), 5. VI (1). Pine and mixed vegetation.

The Eastern Meadow Brown is found in Turkey, Iran and the Levant. In Jordan, it is restricted to the northern Mediterranean zone (Larsen & Nakamura, 1983). It was common species in the reserve mainly camouflaged on the litter of deciduous oak.

***Melanargia titea palaestinensis* Staudinger, 1901**

Material: 1. V (2), 2. V (4), 3. V (1), 7. V (1), 8. V (14), 14. V (5), 15. V (1), 16. V (2), 18. V (3), 25. V (2), 5. VI (1). Pine and mixed vegetation.

The Palestine Marbled White occurs in the Levant. Larsen & Nakamura (1983) mentioned that it is limited in Jordan to the northern Mediterranean zone, but the record from Tafila proves its occurrence in the southern Mediterranean zone also. Larvae feed on grasses and adults are attracted to the flowers of *Centaurea*. It was found very common on flowering plants in the reserve mostly in the open areas.

(Moths)**Family Geometridae*****Aplocera plagiata* (Linnaeus, 1758)**

Material: 15. V (1). Pine vegetation.

The Treble-bar is found throughout the Palearctic region and the Near East. The larvae feed on various species of St John's wort.

***Gnophos* sp.**

Material: 15. V (1). Pine vegetation.

***Rhodostrophia tabidaria* (Zeller, 1847)**

Material: 8. V (1). Pine vegetation.

***Peribatodes* sp.**

Material: 19. IV (1); 2. V (1). Pine vegetation.

Family Lymantriidae***Lymantria lapidicola* (Herrich-Schäffer, 1851)**

Material: 17. V (1). Pine vegetation.

This moth is found in Turkey, Armenia, Iran, Near East, Syria, Lebanon, Iraq, Palestine, and Sardinia. Larva on *Prunus* and *Crataegus*. Recorded in Jordan for the first time.

Family Noctuidae***Acontia lucida* (Hufnagel, 1766)**

Material: 14. V (1). Pine vegetation.

This moth is a West-Palearctic species. It is a migrant species in the Levant. Larvae feed on *Malva* sp. Our specimen was collected by the net during the day.

***Agrotis segetum* (Denis & Schiffermüller, 1775)**

Material: 29. III (1). Pine vegetation.

It is found in Palearctic, Afrotropical and Indo-Pacific regions. In our area it is found in all the Levant, in addition to Sinai and Cyprus. A known pest of vegetables and cereals.

***Agrotis spinifera* (Hübner, 1808)**

Material: 9. V (1). Pine vegetation.

It is found in Africa, Mediterranean basin, Arabian Peninsula, subtropical and tropical Asia. Larvae feed on herbaceous plants, sometimes a minor pest of vegetables.

***Catocala conversa* (Esper, 1787)**

Material: 23. V (1). Pine vegetation. This is a Mediterranean species. In the Levant, it is found in Palestine and Lebanon. It is recorded from Jordan for the first time. It feeds on *Quercus* sp. The larvae may reach pest status were the oak trees become largely defoliated.

***Noctua comes* Hübner, 1813**

Material: 23. V (1). Pine vegetation.

This is a West Palearctic species. It occurs in all Levant countries. Usually found in open and forested grasslands.

***Noctua pronuba* (Linnaeus, 1758)**

Material: 15. V (1). Pine vegetation.

A West Palearctic species. It was introduced to the Nearctic Region. It is a highly polyphagous species which may be a pest on wild as well as cultivated plants.

Family Zygaenidae

***Zygaena graslini* Lederer, 1855**

Material: 18. IV (1). Pine vegetation.

This slow-flying moth is usually found on flowers of many kinds in the spring.

Order Hymenoptera

Family Anthophoridae

***Anthophora* sp.**

Material: 12. V (4). Strawberry vegetation.

The Digger Bees were found in the Strawberry trees area sinking in the pitfall trap.

Family Apidae

***Apis mellifera* Linnaeus, 1758**

Material: 18. IV (2), 1. V (1), 2. V (1), 4. V (1), 6. V (1), 8. V (1), 10. V (1), 16. V (3), 17. V (1), 18. V (4), 25. V (1). Pine vegetation.

The honey bees collected from the reserve came most likely from hives in nearby farms. A big wild hive was found in Al- Aqra Mountain in the reserve.

***Bombus terrestris* (Linnaeus, 1758)**

Material: 19. IV (6), 1. V (1), 2. V (4), 4. V (2), 8. V (4). Pine vegetation.

These are called the Bumble Bees. They are large beautiful bees and they are important plant pollinators. Natural colonies were observed in the ground in the reserve area. It is a common species and was found all around the reserve area.

***Melecta* sp.**

Material: 20. III (1), 11. IV (1). Pine and mixed vegetation.

One of the specimens was collected from the Pitfall Trap in the mixed vegetation area while the other was collected by the net.

Family Formicidae

***Dorylus (Typhlopone) fulvus punicus* Santschi, 1926**

Material: 24. V (1). Pine vegetation..

This species was collected in large numbers in light traps in the University of Jordan Farm in the central Jordan Valley. The large winged males were collected by light trap.

Family Vespidae

***Vespa germanica* (Fabricius, 1793)**

Material: 18. V (4). Pine vegetation.

The German wasp is native to Europe, but it is now found in many parts of the world.

Conclusion

A total of 122 insect species in 11 orders and 42 families were identified from the Dibeen Forest Reserve in this survey. Nine of these species were recorded for the first time from Jordan. One of the big problems in conducting such a research is dealing with the identification of the highly diverse group insects. Literature, experience and time are limiting factors in this process. Many insects were identified by the available literature, by comparing them to identified specimens preserved in the University of Jordan Insect Museum, or they were sent to experts in Jordan or outside the country. However, many unidentified species were also collected that belonged to different insect groups such as Thysanura, Diplura, Isoptera, micro-Lepidoptera and ants. Some species, such as cicadas, were heard but not collected because they were at high levels on pine trees.

The recorded species is a first contribution to the entomofauna of the reserve and it shows a promising diversity in such a small reserve. But this survey should be considered a baseline survey, and should be followed by continuous sampling for several years, to accumulate a comprehensive species list of the reserve.

The Dibeen Reserve is considered a good butterfly habitat for many species since about one fourth of the Jordanian butterflies were recorded in the reserve. *Hyponephele lycaon libanotica* and *Kirinia roxelana* are rare and new records to Jordan. In addition, *Limenitis reducta schiffermuelleri*, *Vanessa atalanta*, *Carcharodus orientalis maccabaeus* are rare species in Jordan (Katbeh-Bader *et al.*, 1998). Rare butterflies indicate areas that need to be targeted in habitat conservation (Collins *et al.*, 1985). Therefore, special interest should be directed to complete the list of butterfly species of the reserve, determine their host plants and conserve them. Obviously, collecting rare species, except for scientific research, should be prohibited in the reserve.

Some other insects were found to be rare in the reserve. The grasshopper *Acinipe davisi* was recorded for the first time in Jordan although grasshoppers were widely collected from different parts of Jordan for the last several years (Katbeh-Bader, 2001). Furthermore, few nests of bumblebees, *Bombus terrestris*, were seen in the soil in the undisturbed areas in the reserve. This emphasizes the need to prevent the disturbance in the reserve. It is believed that the reserve may be a good source of pollinating insects to nearby farms.

On the other hand, some species were considered common since they were found in large numbers in most of the reserve areas using the different methods of collecting. For example, the histirid beetle *Margarinatus graecus* was found in all vegetation types selected for the pitfall trap. The carabid beetles (*Carabus hemprichi*, *Nebria hemprichi*, *Calathus syriacus*), the scarab beetle, *Maladera syriaca*, and the tenbrionid *Tentyria rotundata* were found common in the reserve. Such species should be targeted in future ecological studies and may be considered as indicators for changes in the ecosystem. The same locations and number of traps should be used so that results can be compared from one study to another. The number of species and the number of individuals per species per trap or group of traps per certain unit of time can be compared. Any decline in the individuals of a certain species should be investigated.

The common Rock Rose Plant, *Cistus creticus*, and *C. salvifolius* deserve special attention since their flowers represented an attractive habitat for several insect species, especially at times were most other flowers in the reserve have dried towards the end of spring. Even though these plants are considered as degradation indicator species, they are important for flower-seeking insects such as butterflies, flies, bees, wasps, beetles, other insects and arthropods.

It was clearly noticed during this survey that areas frequented by visitors of the reserve were seen devoid of their natural vegetation and therefore, few numbers of insects or sometimes no insects were found. This proves the effect of disturbance, and emphasizes the need to protect such areas by restricting the movement of visitors in order to allow the different species to re-inhabit such areas. Preventing taking file from plant material fallen under trees is important since this is an important habitat for many species such as diplurans, silverfish, beetles, even some kinds of butterflies and many arthropods like millipedes and centipedes.

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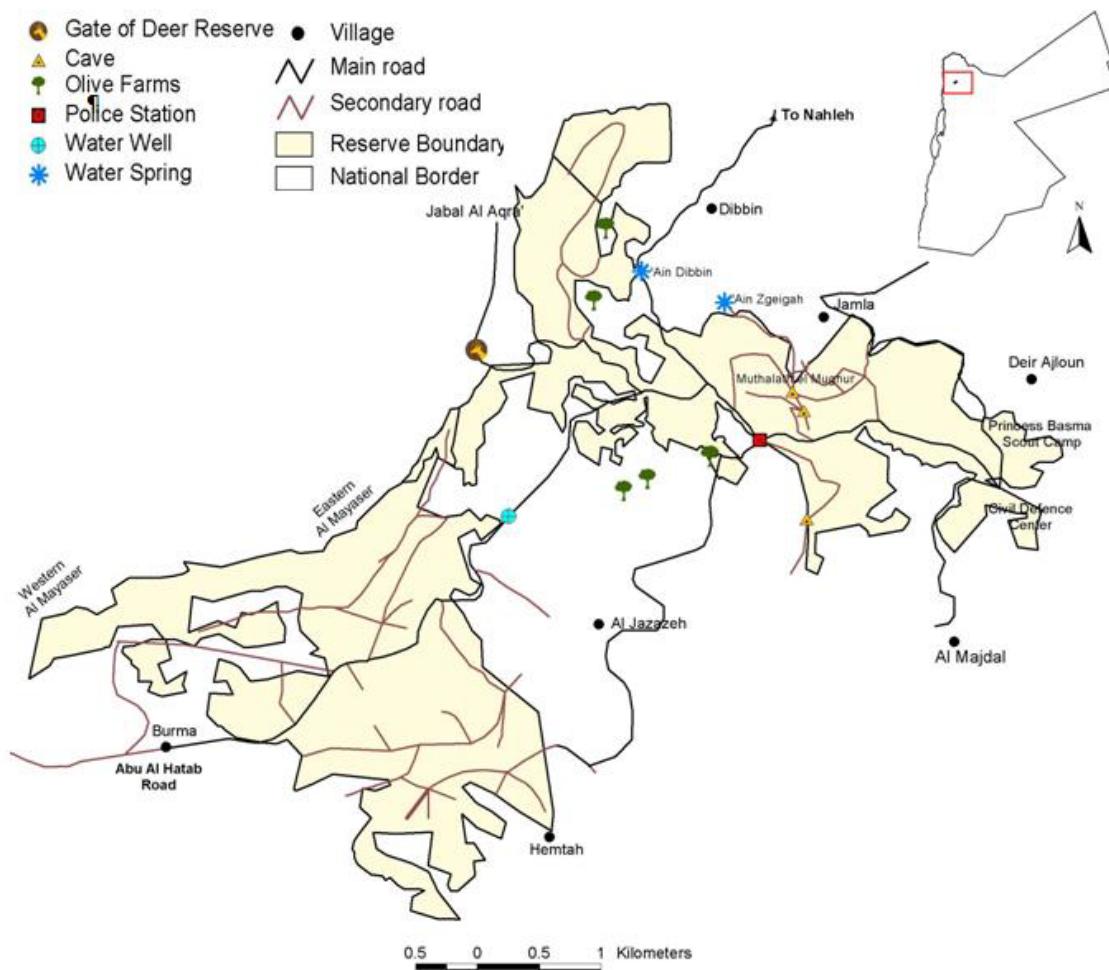


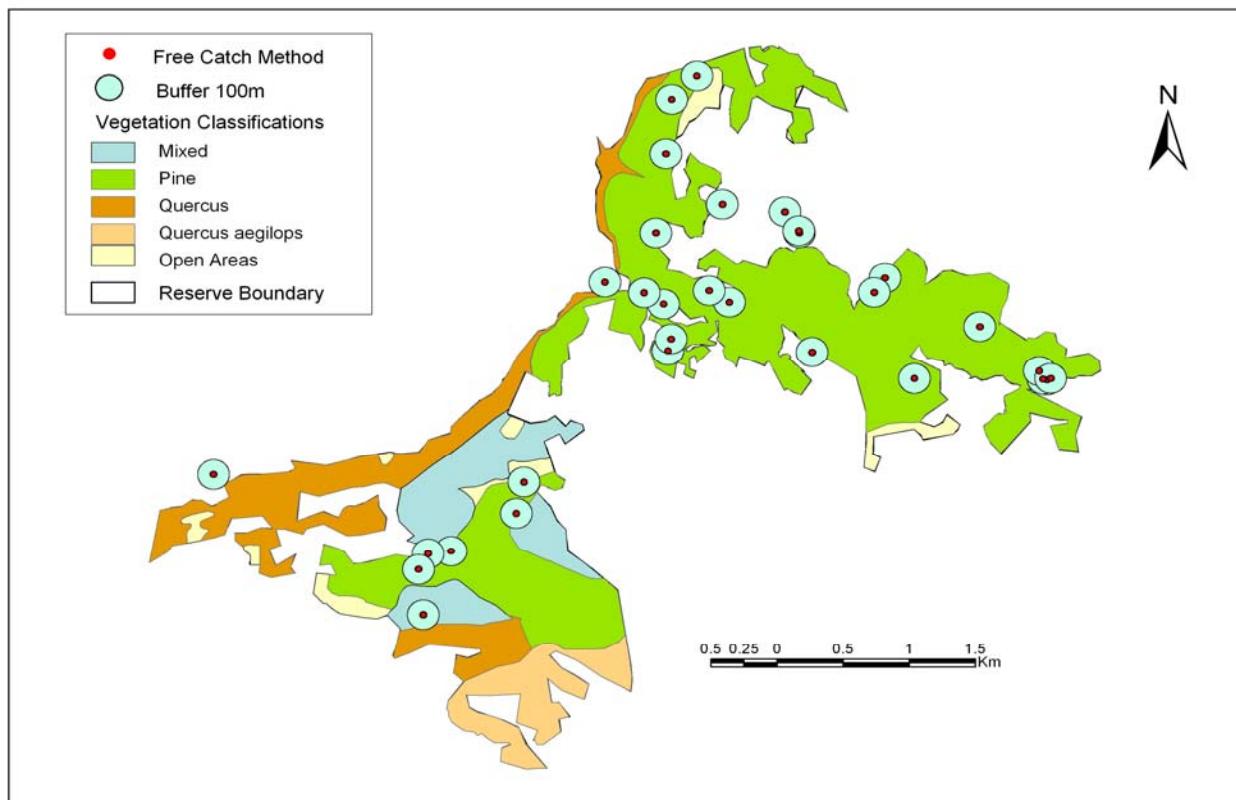
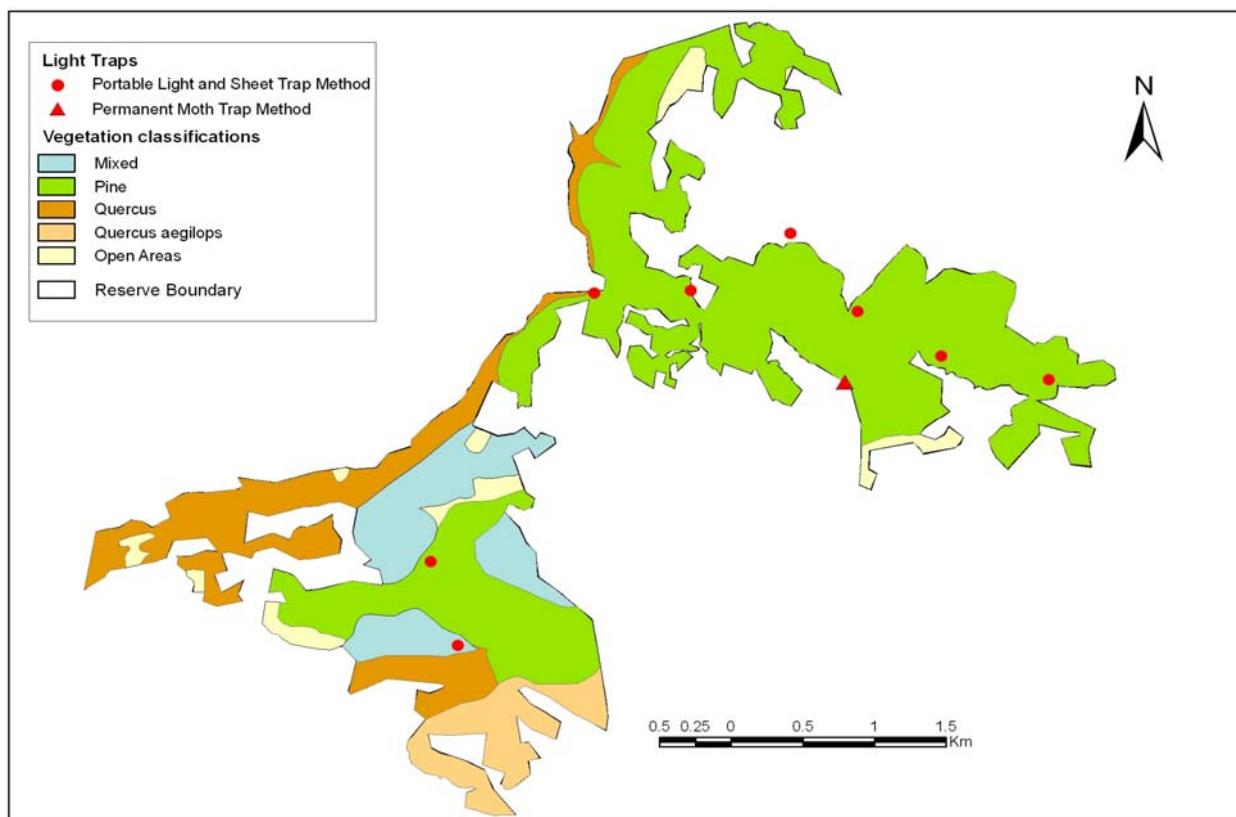
Fig. 1. Location and map of Dibben Reserve



Fig. 2. Pine trees at the entrance of Dibeen Reserve.



Fig. 3. Strawberry-trees (*Arbutus andrachne*) in the Dibeen Reserve.

**Fig. 4.** Collecting sites in the Reserve.**Fig. 5.** Locations of light traps in Dibeen Reserve.

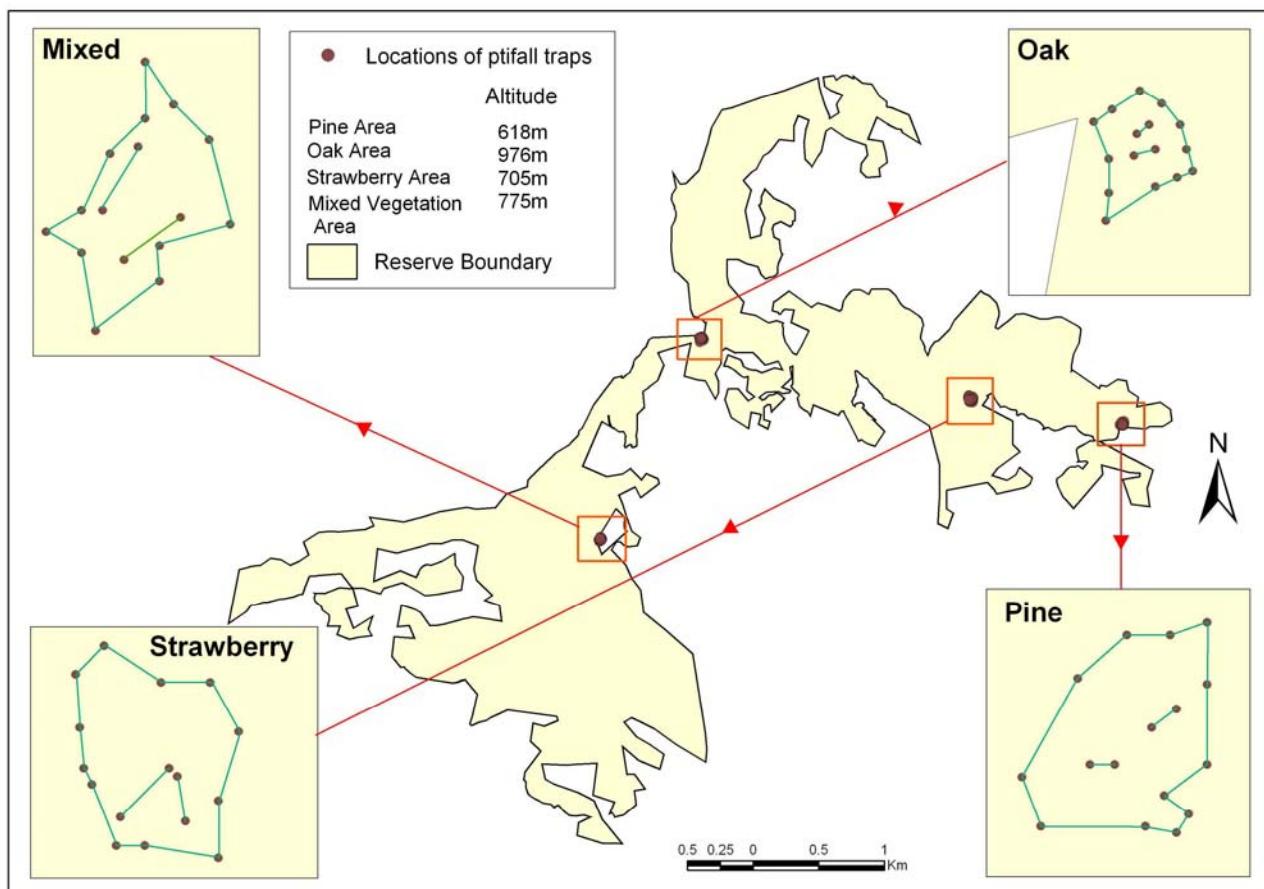


Fig. 6. Locations of pitfall traps in Dibeen Reserve.

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Caloptilia robustella Jäckh, 1972 and *Caloptilia (Povolnya) leucapennella* (Stephens, 1835)
in Turkey
(*Lepidoptera, Gracillariidae*)

Tomasz Jaworski

Abstract: *Caloptilia robustella* Jäckh, 1972 and *Caloptilia (Povolnya) leucapennella* (Stephens, 1835) in Turkey (*Lepidoptera, Gracillariidae*). Cesa News 49: 42-44, 3 figs.

This paper deals with the faunistical records of two gracillariid species in South Turkey, observations on their biology, and brief descriptions of larvae and pupae.

Keywords: *Caloptilia, robustella, leucapennella, Lepidoptera, Gracillariidae, Turkey, fauna, biology, larva, pupa, foodplant.*

Introduction

According to Koçak & Kemal (2009) fauna of Turkish lepidoptera comprises 77 species of *Gracillariidae*, while De Prins, J. & De Prins (2006) mentioned 80 species of this family. Among them, *C. robustella* and *C. leucapennella* are considered as native species, but no particular data on their biology and distribution is given (Koçak, pers. comm.). The aim of this paper is to provide some new information on the occurrence and biology of *C. robustella* and *C. leucapennella* in Turkey.

Both species are representatives of endophagous organisms, generally known as ‘mining insects’. Larvae of early stages live internally, burrowing corridors in leaf parenchyma, while older instars are external feeders. After leaving the mine, larvae begin to make conspicuous shelters in which they feed on a leaf tissue. In order to that, larva spun the blade of a leaf with joints of silk. During its lifetime, larva builds few shelters differing in size, as it grows. Larval shelters are of ‘cone’ shape and are quite similar to those of many other species of this genus. Usually the shelter is made of a leaf-lobe or an apex of lamina is used, especially when the leaf blade is small or the lobes are not well developed.

Pupation takes place in whitish, elongated cocoon, which is attached to the leaf surface on its lower side. Frequently, the site of pupation is very distant from feeding place, located on different branch of the tree. Adults emerge after few days from pupation, but the development probably depends on thermal conditions.

Various species of oaks (*Quercus* L.) are the food plants for both species, however common beech (*Fagus sylvatica* L.) and sweet chestnut (*Castanea sativa* Mill.) are sometimes listed as an optional hosts, especially for *C. robustella* (De Prins & De Prins, 2006).

***Caloptilia robustella* (Jäckh, 1972)**

(Fig. 1)

Materials examined: 1 ex. (female), e. l. 06 VII 2009, larva 15 VI 2009. Larval shelters where collected from *Quercus petraea* (Matt.) Liebl.

Locality: 5 km SE of Hasanbeyli (Osmaniye prov., Hasanbeyli distr.), 37°06'N 36°36'E, UTM: BB81, 1100 m.

The adults of *C. robustella* are very similar to those *C. alchimiella*, much more frequent, oak-feeding gracillariid. They can be often distinguished by the shape of costal blotch on forewing, but confident determination is based on the dissection of genital apparatus. Adequate information on this matter was given by Emmet *et al.* (1985).

***Caloptilia leucapennella* (Stephens, 1835)**

(Fig. 2)

Materials examined: 6 exx. (5 males, 1 female), e.p. 19-21 VI 2009, pupae 13 VI 2009. Larval shelters and cocoons were collected from *Quercus ilex* L. and *Q. cerris* L.

Locality: 7 km SE of Güzeloluk (Mersin prov., Erdemli distr.), 36°44'N 34°07'E, UTM: WF97, 1300m.

Little is known about the biology of *C. leucapennella*, but it is probably similar to previous species. Description of larval shelter, given by Heath and Emmet (1985), suggests that larva of *C. leucapennella* constructs “a cone at the tip of a leaf” but in the present case, a roll-like shelter (Fig. 3), resembling those of some *Tortricidae*, has been observed.

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Fig. 1 - *Caloptilia robustella* from Hasanbeyli



Fig. 2 - *Caloptilia leucapennella* from Güzeloluk



Fig. 3 - A roll-like shelter of Oak leaf (all photos by Jaworski).

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